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The following publications have come to hand.

The Transactions of the Provincial Medical and Surgical Association, instituted 1832. Volume IV. London and Worcester, 1836. 8vo, pp. 578.

On the Antidotal Treatment of the Epidemic Cholera, with a Sketch of the Physiology of this Disease as deduced from that of Intermittent Fever. By John Parkin, Honorary and Corresponding Fellow of the R. Acad. of Medicine and Surgery, Madrid. London, 1836. 8vo. Pp. 112.

Quackery: its Danger, Irrationality, and Injustice; the Causes of its Success; the best means for its Suppression. Addressed to all Classes. Bath, 1836. 8vo. Pp. 18.

Outlines of Comparative Anatomy; by Robert E. Grant, M. D., F. R. S. Ld. et Ed., &c. Part Third, containing Nervous System, Organs of the Senses, and Digestive Organs, with twenty-three woodcuts. London, 1836. 8vo. P. 225 to 352.

A Dictionary of Terms employed by the French in Anatomy, Physiology, Pathology, Practical Medicine, Surgery, Midwifery, Pharmacy, Medical Zoology, Botany and Chemistry, with their Derivation from the Greek, Latin, French, German, and English; Explanations in English; and Illustrations in the different Languages. By Shirley Palmer, M. D. formerly of Tamworth. Part II. Corné. Pp. 161.—Huit de Chiffre, p. 321. Birmingham and London, 1836. 8vo.

Address of the Earl of Stanhope, President of the Medico-Botanical Society, for the Anniversary Meeting, January 16, 1836, London, 1836. 8vo. Pp. 31.

Suggestions for obtaining the best Medical Advice at the least possible Expense. Addressed to Persons of Limited income but Respectable Station in Society. London, 1836. 12mo. Pp. 8.

St Thomas's Hospital Reports. By John F. South, Assistant Surgeon. No. IV. June 1836. London. P. 353 to p. 456.

Separation of Arsenic. From the Transactions of the Society of Arts, Vol. li. by Mr James Marsh. Pp. 11.

The Speculum applied to the Diagnostic and Treatment of the Organic Diseases of the Womb; an Inaugural Dissertation presented to the University of Glasgow for the Degree of Doctor in Medicine. By John Balbirnie, A. M. London, 1836. 8vo. Pp. 335.

On the Efficacy of Carbonic Acid Gas in the Diseases of Tropical Climates; with Directions for the Treatment of the Acute and Chronic Stages of Dysentery. By John Parkin, Honorary and Corresponding Member of the Royal Academy of Medicine and Surgery, Madrid, &c. &c. London, 1836. 8vo. Pp. 64.

The Practical Anatomy and Elementary Physiology of the Nervous System; designed for the Use of Students in the Dissecting-Room. By Frederic Le Gros Clark, Demonstrator of Anatomy in St Thomas's Hospital. London, 1836. 12mo. Pp. 367

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The Northern Flora; a Description of the Wild Plants belonging to the North and East of Scotland. By Alexander Murray, M. D. Part I. 1836.

A Treatise on Insanity and the Disorders affecting the Mind. By James Cowles Pritchard, M. D., F. R. S., &c. London, 1835. 8vo. Pp. 483.

An Introductory Lecture delivered to the Mathematical Class at the Royal School of Medicine and Surgery at Birmingham, 12th May 1836. By the Reverend William Morrell Lawson, M. A., Perpetual Curate of Moseley. Birmingham, 1836. 8vo. Pp. 53.

Researches into the Physical History of Mankind. By James Cowles Pritchard, M. D., F. R. S, M. R. I. A., &c. Third edition. Vol. I. London, 1836. 8vo. Pp. 376.

The Cyclopædia of Anatomy and Physiology. Edited by Robert B. Todd, M. D., Professor of Physiology and of General and Morbid Anatomy in King's College, London, &c. Part VIII. September 1836. (*N. B.* Part VII. not yet received.) Large 8vo. Pp. 713 to 813.

Recherches Anatomiques et Physiologiques sur l'Organe de L'Ouie et sur l'Audition dans l'Homme et les Animaux Vertebrés. Par M. Gilbert Breschet, Membre de l'Institut de France, &c. 2ieme Edition, a laquelle on a ajouté l'Histoire du plexus nerveux du Tympan. Avec Treize planche Gravées. Paris, 1836. 4to. Pp. 295.

The Medical Gazette for Session 1835–1836, from No. 26, March 26th, to No. 50, September 10th. London, 1836.

The India Journal of Medical Science, No. 1 to 18, 1st June 1835, inclusive. Edited by Messrs J. Grant and J. T. Pearson. Calcutta, 1835. No. 19 to No. 23, Nov. 1835. And No. 1, 2, 3, New Series, 1836. Edited by Frederic Corbyn, Esq. Calcutta, 1836.

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The British and Foreign Medical Review, or Quarterly Journal of Practical Medicine and Surgery. Edited by John Forbes, M. D., F. R. S.; and John Conolly, M. D.

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8. Asarabacca.
9. Asparagus.
10. Avens.
11. Balm.
12. Barberry.
13. Bearberry.
14. Bear's-breech.

PART II.—JUNE.

15. Bear's-foot.
16. Beet.
17. Betony.
18. Bindweed.
19. Birch.
20. Birthwort.
21. Bistort.
22. Biting-Persicaria.
23. Bitter-sweet.
24. Blue-bottle.
25. Borage.
26. Bramble.
27. Brooklime.
28. Broom.

PART III.—JULY.

29. Bryony.
30. Buckbean.
31. Buckthorn.
32. Bugle.
33. Bugloss.
34. Burdock.
35. Burnet-Saxifrage.
36. Butcher's-broom.
37. Calamint.
38. Caraway.
39. Carrot.

PART IV.—AUGUST.

40. Catmint.
41. Celandine.
42. Centaury.
43. Chamomile.
44. Chestnut.
45. Chervil.
46. Cinquefoil.
47. Clary.
48. Cleavers.
49. Clove-Pink.

PART V.—SEPTEMBER.

50. Colchicum.
51. Coltsfoot.
52. Columbine.
53. Comfrey.
54. Coriander.
55. Cowslip.
56. Crowfoot.
57. Cuckoo-flower.

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58. Cumin.
59. Currant.
60. Daisy.
61. Dandelion.
62. Darnel.
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64. Dodder.
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THE

EDINBURGH

MEDICAL AND SURGICAL JOURNAL.

1. JULY 1836.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Report of the Cases treated during the Course of Clinical Lectures delivered at the Royal Infirmary in the Session* 1834-1835. By DAVID CRAIGIE, M. D., F. R. S. E., &c. Physician to the Royal Infirmary, and Lecturer on the Practice of Physic. (Published by permission of the Honourable Board of Managers.)

THE period occupied by the following Report extends from the 25th of October 1834 to the 24th October 1835, during which time two courses of lectures on Clinical Medicine of six months duration each were delivered. It would be tedious and unprofitable, as well as unnecessary, to distinguish, according to these artificial periods, the cases treated and made the subject of clinical instruction. I shall retain the division observed on occasion of my last report, and distinguish the cases into those of fever, and those of ordinary medical cases, acute and chronic. The cases of fever, of which I propose to treat first, will occupy a considerable share of attention; and it will be sufficient to confine to them the observations now to be made.

It will not be necessary to enter so minutely into the semiography, pathology, and treatment of fever, as I did on the occasion of my last report. It will be sufficient to advert to a few of the leading facts, pathological and practical, furnished by the cases treated; and the most convenient and expeditious method of accomplishing the objects which I have in view will be, by first giving a tabular view, of the cases, and then by directing attention to such of them as seem most directly to furnish important results.

TABULAR VIEW of 174 Cases of Fever, being the number treated in the Royal Infirmary, Ward No. 9, from October 25th 1834 to October 20th 1835.

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease on admission.*	*Pulse on admission.*	*Local complications.*	*Days in Hospital.*	*Event.*
1	Broadley	24			Contagion	4th	110, soft	Head	24	Cured
2	Gilfillan		Carrier			do	100, small	do	39	do
3	Menzies	31	Shoemaker			8th	130, do	Head and chest	30	do
4	M'Kean	7			None	3d	120, do	Head	20	do
5	Ormiston	11				14th	slow	Chest	14	do
6	Stark	20	Sailor			6th	96, full	Head	13	do
7	Millar	45	Mason		do	12th	92, tense	do	15	do
8	Smith	31	Servant	Sober	Contagion	9th	120, full	General	15	do
9	Wilson	18	Carter			20th	104, do	Abdomen and head	15	do
10	Fisher	19			Cold	8th	120, do	Chest and head	41	do
11	Bisset	35			Contagion	5th	100, small & weak	Head (severe)	5	Died
12	T. Bisset				do	2d	do	Abdomen	6	Cured
13	Aytoun	22	Cork-cutter			6th	96	General	14	do
14	Bryden	9				4th	120	Head	17	do
15	J. Gray	17			do	12th	88, moderate stren.	do	23	do
16	Gray	12			do	6th	112, small & weak	do	6	Died
17	A. Gray	15			do	do	104, weak	do	22	Cured
18	Thomson	33				4th	116, good strength	do	33	do
19	W. Gray	5			do	do		General	50	do
20	Elder	19				5th	130, soft	do	31	do
21	Kellie	45				12th		Head and chest	31	do
22	Carnie	20	Fisherman			9th		Head	29	do
23	Thomson	27				10th	76	General	10	do
24	Fergusson	34				15th	130, weak	Head and general	26	do
25	M'Cleesky	9				10th	140	Head	56	do
26	Welsh	9				4th	108	Chest	24	do
27	Cairns	40				6th	92, firm	Head	39	do
28	M'Donald	12				5th	120, good strength	do	45	do

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease.*	*Pulse on admission.*	*Local complications.*	*Days in house.*	*Event.*
29	Hawthorn	11				3d	100	General	90	Cured
30	Howard	20				4th	108	Head	43	do
31	M'Beath	27				6th	102	do	23	do
32	Gilmore	30	Labourer	Sober	Cold and wet	14th	90, soft	Chest and head	27	do
33	Stewart	35	Chairman	do	Cold	8th	do	General	17	do
34	Atchison	36	Shoemaker	Dissipated	No contagion	12th	do	Head	7	do
35	Ritchie	50	Porter	Sober	Contagion	4th	90, full	Head and abdomen	10	Died
36	Spence	46	Tailor	Rather dissipated	Cold	4th	96, soft	General	6	Cured
37	Aytoun	22	Cork-cutter		Relapse	6th of relapse	100	do	35	do
38	Marr	26	Tailor		Cold	8th	do	Chest	30	do
39	Borthwick	52	Paper-maker	Tolerably sober	No contagion	6th	100, soft intermitt.	Head, hiccup, convulsions	10	Died
40	Blackie	22	Watchman		Cold	11th	84, good strength	General	10	Cured
41	Drummond	30	Tailor			6th	100, soft	do	28	do
42	Penman	19	Musician		Contagion	4th	108, do	Head	24	do
43	Cowan	19	Dyer			14th	104, feeble	Head and abdomen	29	do
44	Lamb	45	Smith		Cold	19th	70, weak irregular	Head	8	Died
45	Cockburn	64	Carter			4th	96, feeble	Chest and abdomen	17	Cured
	Barker						Imperceptible	Moribund		Died
46	Ross	19	Umbrella-maker		do	21st	112, small	General	24	~~do~~
47	Meiklejohn	14	Shoemaker		Contagion	14th	112, soft	do	20	do
48	Trotter	32	Mason		Cold	16th	do	Head	30	do
49	Russell	17	Tailor		Contagion	5th	84, soft	Chest	17	do
50	Elliot	33	Coachman		Cold	16th	112	Head	17	do
51	M'Kenzie	41	Tailor			14th	92, natural strength	General	29	do
52	J. Barker	6	do			4th	132	Head and abdomen	24	do
53	Leadbitter	54	Joiner			4th	72, natural	Head (severe)	7	Died
54	Congleton	15	Baker		Contagion	8th	66, soft	Head and chest	14	Cured
55	Green	46	Portrait-painter	Irregular		7th	132	Abdomen	33	do
56	Scott	24	Carter		Cold	6th	112	Head	25	do
57	Monaghan	37	Scavenger			5th	116, good strength	Head and old chest	6	Died

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease on admission.*	*Pulse on admission.*	*Local complications.*	*Days in house.*	*Event.*
58	Finnie	29	Plasterer		Contagion	7th	96	Head and chest	26	Cured
59	Walker				Cold	9th	104	General	48	do
60	Tho. Coutts	13			Contagion	9th	120, soft	do	24	do
61	Dowley	9			Cold	4th	108, good strength	Head & abdomen	25	do
62	J. Coutts	47	Musician	Dissipated		13th	120, weak intermit.	Head	2	Died
63	Baird	50			Insensible on admission		132	do	2½	do
64	M'Ivor					5th	104, good strength	General	16	Cured
65	Home	25	Blacksmith		Contagion	2d	100, full	Head and chest	33	do
66	Watt	9				9th	130	Head and abdomen	28	do
67	Ross	7				5th	120, small	Abdomen	18	do
68	W. Ross	35	Blacksmith	Dissipated	Contagion	9th	90, good strength	Head	29	do
69	Lyons	57	Soldier	do	Cold	7th	104	Chest, &c.	19	do
70	B. Orr	31	Labourer	Symp. of delirium	Contagion	7th	112	Head	27	do
71	Harvey	30	Shoemaker			8th	92	Chest	27	do
72	Johnstone	50	Joiner		Contagion	9th	108	Head	26	do
73	M'Gregor	36	Tobacco-spinner		Cold	6th	108, full	do	31	do
74	Conolly	35	Weaver			7th	100, soft	do	6	Died
75	West	13				5th	128	Abdomen	21	Cured
76	Cuddie	3	Tailor		Contagion	4th	Frequent	Slight abdominal	16	do
77	O'Connor	28	Hawker		do	5th	120	Head and chest	34	do
78	Gordon	27	Policeman			4th	76	Head	10	do
79	M'Kay	28	Nothing		Contagion	5th	120, full	General	15	do
80	Paterson	45		Admitted in a state of complete stupor			84	Head	4	Died
81	Duncan	20	Victualler		Contagion	2d	120, full	Abdomen, general	32	Cured
82	Dowley	43	Labourer		do	8th	92	General	46	do
83	Forsyth	11				4th	140	Abdomen	31	do
84	Dickinson	16			Cold	6th	124	General	26	do
85	Ward	5			Contagion	5th	140	Head	37	do
86	J. Orr	26	Drayman	Symp. of delirium tremens	Never able to answer questions		88	Head and abdomen	5	Died

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease on admission.*	*Pulse on admission.*	*Local complications.*	*Days in house.*	*Event.*
87	James Orr	34	Labourer	Dissipated	Contagion	6th	110	Head	21	Cured
88	Barclay	45	Tailor		Cold	10th	64, natural	Head (slight)	11	do
89	M'Kenzie	20	Blacksmith			11th	116	Head	24	do
90	Naughton	20	Labourer		Cold	9th	108	do	42	do
91	Malone	16	Plasterer		Cold	8th	108	Head and general	60	Cured
92	Ross	25	Smith		Contagion	8th	120	Head	13	do
93	Robertson	46	Gardener			6th	76	do	22	do
94	Cuddie	50	Tailor		Contagion	6th	132	do	3	Died
95	Braidwood	28	do			6th	100	Head and chest	36	Cured
96	Scott	18	Bookbinder		Contagion	4th	96, full strong	Head	30	do
97	Gillon	12			do	7th	140, small	do	31	do
98	Johnstone	12			do	6th	120	Head and abdomen	27	do
99	Palliser	36	Painter			6th	140, soft	Head general	6	Died
100	M'Kean	44	Hawker	Sober		9th	110, do	Head	22	Cured
101	Cumming	47	Weaver	do		14th	110, small	Chest	34	do
102	Sutherland	46	Shoemaker		Contagion	9th	98, soft	do	33	do
103	John Leadbetter	24	Woollen manufacturer		do	7th	92, small	Head	35	do
104	O'Niel	24	Scavenger		Cold	9th	126, do	Head and chest	27	do
105	Summers	9				6th	120, do	Head	28	do
106	Cowie	45	Cabinet-maker	Dissipated	Contagion	4th	110	Head and chest	8	Died
107	Kynock	53	Labourer	Sober	do	9th	88, soft	Chest	42	Cured
108	Balfour	66	Gardener	Dissipated	do	10th	88	Head	31	do
109	M'Lelland	16	Weaver		do	5th	90	Abdomen	36	do
110	Sweenie	22	Sailor		Cold	3d	130, soft	Chest	6	do
111	Christie	9			Contagion	6th	120	Head	46	do
112	Henderson	22	Labourer	Dissipated	Blow and contagion	14th		do	6	Died
113	Gibson	10			Contagion	5th	120	Abdomen	25	Cured
114	Jackson	46	Mason	Sober	do	4th	110, soft	Head and chest	25	do
115	Bain	45	Printer		do	6th of relapse	110, small	Head	3	Died

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease on admission.*	*Pulse on admission.*	*Local complications.*	*Days in house.*	*Event.*
116	Vickers	58	Labourer	Dissipated	No cause	17th	100, small irregular	Head (severe)	3	Died
117	Abercromby	19	Gardener	Sober	do	9th	96, feeble	Head	42	Cured
118	Christie	14			Contagion	9th	120	Head and chest	44	do
119	M'Ivor	67	Labourer		No cause	5th	100	Chest	17	do
120	Cameron	64	Comb-maker	Sober	do	14th	38, small	General	14	do
121	Sinclair	38	Candle-maker		Contagion	6th	120, soft	Head and chest	16	do
122	Urquhart	28	Tailor		Cold	9th	140, small	Head and abdomen	20	do
123	Fergusson	9			None	3d	120, good strength	Head	27	do
124	Skene	60	Trunk-maker	Sober	Contagion	11th	112, intermitting	General	60	do
125	Crae	22	Shoemaker	Sober	Contagion	8th	100, good strength	Head and general	12	Cured
126	James Coutts	16			do	5th	110, soft	Chest	32	do
127	Loutchet	24	Cook	do		10th	100, do	General	15	do
128	Burns	14	Baker			5th	104, firm	Head	25	do
129	Congalton	24	do	do	Cold	13th	100, good strength	Head and general	14	do
130	Fairgrieve	16	Japanner		Contagion	4th	110	Chest	8	do
131	Monteith	45	Labourer	do	over-exertion	7th	110, soft	General	18	do
132	Wilkinson	25	Baker	do	none	6th	92	do.	8	do
133	Grierson	18	Cabinet-maker	do	Contagion	4th	112, soft	Head and abdomen	22	Died
134	Kennedy	14			do	3d	100, good strength	No local	20	Cured
135	Boswell	25	do	do	do	7th	108, do	Severe head and slight chest	42	do
136	Mack	8			do	4th	104	Head and abdomen	60	do
137	Oliver	8			do	6th		Chest	21	do
138	Black	30	Labourer	do	None	6th	100, soft	Head and general	6	do
139	Kerr	56	Baker	Dissipated	Contagion	15th	92, small	Chest	8	Died
140	Davie	15	Cowfeeder		do	5th	70, good strength	Head and general	4	Cured
141	Ness	10			do	4th	92	Chest and abdomen	22	do
142	Sommerville	15	Type-founder		do	6th	108, firm	Head and chest	19	do
143	Dickinson	19	Law-student	Regular	None	6th	124, small	General	12	do
144	Stewart	20	Smith	do	do	5th	110, firm	Head	24	do
145	Cameron	5			do	3d	120, good strength	do	15	do

No.	*Name.*	*Age.*	*Profession.*	*Habits.*	*Cause.*	*Day of disease on admission.*	*Pulse on admission.*	*Local complications.*	*Days in house.*	*Event.*
146	M'Kay	67	Shearer		Cold drink	6th	80, firm	Head and chest	21	Cured
147	Tiernan	24	Shearer		None	11th		General	15	do
148	Thomson	32	Cabinet-maker	Sober	Contagion	6th	104, firm	do	21	do
149	Cairns	15			do	4th	116	Head	51	do
150	Mowat	13			do	3d	120, soft	do	40	do
151	Bell	9			do	6th	98	Slight general	21	do
152	Fraser	25	Servant	do	None	5th	120, full	Head	13	do
153	Fergusson	51	Carpenter	Dissipated	Contagion	5th	110, soft	Throat	12	Died
154	Hodgson	28	Sailor	Sober	Cold	6th	110, full, firm	Head	7	Cured
155	Lochran	21	Shearer		Over-exertion	7th	80	Head and abdomen	8	do
156	Gordon	33	do	Irregular	No cause	14th	120	Chest	27	do
157	Gorman	21	do		Cold drink, over-heated	6th	110, soft	Abdomen	22	do
158	Miller	54	Mason		Contagion	5th	110, full, soft	Head (severe)	6	Died
159	Muckle	19	Servant		Wet and cold	11th	80, soft	Abdomen	13	Cured
160	Logg	19	Shearer		No cause	7th	110, do	General	17	do
161	Cooper	21	Hawker	Intemperate	Cold	6th	76	Chest and abdomen	44	do
162	Linton	52	Labourer	Sober	Contagion	7th	124, soft	Severe general	48	do
163	Stevens	25	Hostler	Irregular	Cold	11th	110, do	Chest	28	do
164	Pye	32	Chair-maker	Rather irregular	No cause	7th	76	Head	24	do
165	M'Lachlan	9					124	do	84	do
166	M'Cormick	12			Corp. punishment	4th	120, small	Head and chest	24	do
167	Simons	22	Shearer	Sober	Cold and wet	6th	90, good strength	Head and general	47	do
168	Williamson	26	Joiner	do	No cause	5th	110	Chest	19	do
169	Forrester	38	Labourer		Cold and wet	11th	80	Chest and abdomen	29	do
170	Smith	35	Old soldier	Irregular	No cause	1st	80	Head	6	do
171	Hume						108	Chest	17	do
172	Jeffray	38	Joiner		Cold	Insensible on admission	116, small	Head	4	Died
173	Burnet	54	Carter	Intemperate		7th	Imperceptible at wrist	do	2	do
174	Drummond	63		Regular	Contagion	8th	84, full	Head and chest	42	Cured

TABLE II. Of the Cases which terminated Fatally.

Name.	*Age.*	*Day of disease on admission.*	*Local complication.*	*Cause.*	*Habits.*	*Days in house.*	*Fatal day of disease.*	*Pulse on admission.*
Vickers	58	17th	Head	None	Dissipated	3	20th	100, irregular
Kerr	56	15th	Chest	Contagion	do	8	23d	92, small
Millar	54	5th	Head	do	do	6	11th	110, soft
Burnet	54	7th	do	do	do	2	9th	72, impercept.
Leadbetter	54	4th	do			7	11th	72, natural
Borthwick	52	6th	do	No contag.	Irregular	10	16th	100, intermit.
Fergusson	51	5th	Throat	Contagion	Dissipated	12	17th	110, soft
Ritchie	50	4th	Head and abdomen	do & a fall	Sober	10	14th	90, full
Cuddie	50	6th	Head	do		3	9th	132
Baird	50		do	Insensible on admission		2½	?	132
Coutts	47	13th	do		Dissipated	2	15th	120 intermit.
Lamb	45	19th	do	Cold		3	22d	70 irregular
Paterson	45		do	Comatose on admission		4	?	84
Bain	45	6th of relapse	do	Contagion		5	11th	110, small
Cowie	45	4th	Head & chest	do	Dissipated	8	12th	110
Jeffray	38		Head	Insensible on admission		4	?	116, small
Monaghan	37	5th	Head & old chest affect.			6	11th	116
Palliser	36	6th	Head			6	12th	140, soft
Conolly	35	7th	do			6	13th	100, do
Bisset	35	5th	do	Contagion		5	10th	100, weak
Orr	26		Head and stomach	Constant delirium and incoherence		5	?	88
Henderson	22	14th	Head	Blow and contagion	Dissipated	6	20th	
Grierson	18	4th	Head and abdomen	Contagion	Sober	22	26th	112, soft
Gray	12	6th	Head	do		6	12th	112, weak

I. It is superfluous, after the statements given in the last Report, to enter into the details of the treatment generally pursued in these cases. But it may be perhaps not void of interest to illustrate the influence of the measures employed by a short statement of some of the most remarkable cases. For this purpose I shall select three cases;—one, in which the symptoms of fever were either uncomplicated, or betrayed an equal affection of all the organs; another, in which the symptoms were very strongly complicated with those of disorder of the brain and its membranes; and a third, in which they were not only complicated with cerebro-meningeal disorder, but presented also a peculiarly oppressed state of all the vital actions.

Case 1. Joseph Hodgson, aged 28, was admitted on the 3d September, with dingy countenance, not collapsed, heavy eyes, headach, *vertigo* and *pervigilium*, occasional pains in the muscles of the extremities, with stiffness of the joints, much thirst, the pulse at 110, full and firm, the tongue covered with a white fur, the skin hot, and the bowels confined.

These complaints he ascribed to exposure to cold when over-heated, and was not aware of having been exposed to the contagion of fever. He began to complain on the 29th ultimo, of headach, heaviness, and general debility, with inability to exert himself; and he had since been wholly confined to bed.

He was reported to be of sober habits, and he had the appearance of habitual health and strength.

The hair was removed, the bowels were moved by the compound jalap powder, and twenty ounces of blood were drawn from the arm.

After this he had a good night with some sleep; he perspired profusely, and the pains of the limbs disappeared. The pulse was 100, and the tongue still furred. Three colocynth pills were ordered. Five motions took place on the 4th, and he had a good night; but sleep was interrupted by pains of the legs and arms. The effervescing draught was ordered for some sickness. On the 5th, though he had not slept in consequence of pain of the frontal region, where he had a sense of weight, and the pulse was at 64, soft, full, and regular, the fur on the tongue was moist, and the bowels were scantily moved.

Twelve leeches were applied to the frontal region and temples; the feet were fomented; and the bowels were freely opened by the colocynth pill and castor oil.

Next day, (6th,) pain was entirely gone, the pulse 68, the tongue almost clean, and he had no complaint. He left the house on the 8th quite well.

In this case the patient was admitted on the 5th day of the disease; the symptoms underwent a decided abatement in the course of the 2d day after; and they disappeared entirely on the 9th day of the disease.

Case 2. James Fraser, aged 24, a servant, was admitted on the 27th August in a state of delirium, confusion, and restless excitement so considerable, that it was requisite at first to place him in a remote secluded chamber by himself, and subject him to personal restraint. His countenance was depressed but flushed, and the eyes were suffused, injected, and restless, with much contraction of the pupils. The pulse was 120, not full, but somewhat sharp. The tongue was moist, but covered by a thick gray fur; he was very thirsty; and the skin was hot and moist, and mottled with a diffuse spotted eruption. He was also agitated, and the hands were tremulous. The surgeon by whom he was attended stated, that, on the afternoon of Sunday 23d, he was attacked with rigors and intense headach, the latter of which symptoms was alleviated by blood-letting to the extent of 10 ounces, with free purging and the use of antimonials. The headach, however, having recurred, leeches were applied with temporary relief. On the 26th, the day before admission, he became confused, and spoke incoherently, and was very violent during the night, with complete *pervigilium.* On the day of admission some wine was said to have been given; but he was represented to be in general sober and steady; he had been exposed to cold, but, so far as could be ascertained, not to the contagion of fever.

A bolus, consisting of eight grains of calomel and twelve of jalap was immediately given, and there were drawn from the arm 20 ounces of blood, which exhibited the buffy coat, and was cupped. Cold was also applied to the shaven scalp.

In the evening, when the medicine had began to operate, the countenance was less flushed, and the eyes less suffused; but the delirium continued, though in a less violent form. The pulse was also quick, though softer, and the hands were still tremulous.

Six leeches were applied to each temple, and three ounces of the cathartic mixture, with a little tincture of jalap were ordered.

On the 28th, though the leeches bled freely, he spent a very restless and sleepless night, constantly talking incoherently, and occasionally walking about. The face was less flushed, but the eyes continued heavy and suffused. The tongue was loaded and tremulous, but moist; the pulse was 110, soft; and he made no complaint.

Sixteen ounces of blood were ordered to be immediately taken from the arm, and a bolus of 6 grains of calomel and 12 of jalap was directed to be given. When ten ounces of blood were drawn, nausea took place, and the venesection was therefore carried no farther; he afterwards became violent, requiring restraint; but he was more calm in the evening, with less flushed countenance, and answered questions rationally. The bowels had been opened. As he still muttered incoherently, however, he was ordered one drachm of antimonial wine, with half a drachm of the solution of muriate of morphia, to have the cold affusion and cold applications to the head, and a full dose of calomel and jalap next morning.

The use of these measures was followed by a quiet night, and some sleep till four in the morning, after which he again became restless and spoke much.

A blister was applied to the *vertex* previous to the visit, while to the rest of the head the cold applications were continued; and at the visit, when he was in the same state, with the eye injected, and the face flushed, 12 leeches were directed to be applied to each temple; a drachm of the compound powder of jalap was administered; and, unless the symptoms were decidedly relieved in the evening, he was ordered to lose 12 ounces of blood from the arm.

As the pulse continued at 120, small and oppressed, and as he was verging to a state of listlessness and stupidity, notwithstanding that the bowels had been twice moved, and the leeches had bled freely, the general blood-letting to the extent of 12 ounces was performed. The blood drawn was not buffy, but the coagulum was contracted. After this he spent a quiet night, and enjoyed some sleep. Next day, (30th,) the pulse had fallen to 100, and was fuller and less oppressed. The skin was still hot and dry, and the tongue was covered with a whitish fur, dry in the centre, but less so than the previous days.

Four ounces of the cathartic mixture with one of tincture of senna were ordered; the saline mixture every hour was directed to be taken; with the cold affusion to the head and whole person.

Next day (31st) as there had been some delirium during the night, notwithstanding free motion of the bowels, and the use of the cold affusion, ten leeches were applied to each temple and bled freely. After this the eyes became much clearer, and he was much calmer, more rational and more manageable, and was allowed to be placed among the other patients. The muscular motions, however, still continued unsteady. The pulse was 104, of good strength; the respirations 48, chiefly abdominal. The tongue was covered with a thin slate-coloured moist fur.

The use of the cold affusion once daily, or twice according to symptoms, was directed to be continued; a full dose of calomel and jalap was exhibited; and the feet were fomented with cloths wrung out of hot water. A good night with sound sleep and without delirium ensued; and next morning, September 1st, the pulse was at 100, soft, and the tongue was moist at the edges. On the 2d, the pulse was still 100, and notwithstanding that the bowels had been freely moved, the tongue was covered with a dark viscid fur, and the countenance was still flushed. The eyes however were perfectly clear, and the patient complained of thirst.

On the 4th, under the employment of laxative medicine, the pulse fell to 90, the skin became warm and generally moist, and the tongue became moist and clean at the edges. Next day, the pulse fell, after a good night, to 52; and though the tongue presented a thin fur only at the middle, there was a return of appetite. On the 6th the tongue was clean, the pulse 72, and the patient had no complaint; he was allowed full diet on the 7th; and on the 9th he left the hospital quite well, though rather weak.

In this case several remarkable circumstances deserve attention. *First*, there was an intense cerebro-meningeal affection approaching to *meningitis*, and which, it is impossible to doubt, if not promptly opposed by the means of depletion general and local, and the sedative effect of the cold applications, would have gone on to fatal effusion and terminated in comatose death. At the same time this meningeal or cerebro-meningeal affection was not idiopathic, or so pure and uncomplicated as to admit of the depletory measures either in quality or extent being employed without regard to the original cause of the meningeal affection. In a pure idiopathic case of meningeal inflammation, the proper practice is to bleed repeatedly until the symptoms of the inflammation are abated or subdued. In the case of *meningitis*, however, dependent on fever, it is requisite to proceed more cautiously, and attend as much to the general as to the local affection. In this case the symptoms may be controlled and alleviated, but cannot be entirely subdued by any antiphlogistic measures; the disease has to run a certain course; and all that the physician has in his power is to abate their violence and diminish their intensity, until they can be finally removed at the same time, and in the same manner, as the symptoms of fever. It was on this account requisite, in the case now detailed, after one general and one local blood-letting with the usual auxiliaries, to observe the effects produced, and bleed or avoid depletion according as the symptoms indicated.

Secondly, it is important to advert to the fact, that in this instance the patient came into the hospital in a state of great excitement, which seemed to aggravate very much, if it did not give a peculiar character to all his symptoms. He was violent, unmanageable and noisy, vociferated so much as to render it impracticable to allow him to be placed in the same ward with the other patients, and even at one time he required the coercive measure of the strait waistcoat. This though almost always an injudicious measure, and one to which I am personally decidedly opposed, is often in hospital practice difficult to be altogether avoided. In the present case, as in most others, I studied to supersede its employment by blood-letting and other evacuations, the repeated use of the cold affusion, and the occasional employment of tartrate of antimony. This state of intense excitement, which evidently depended on cerebro-meningeal irritation, endured three days; and only subsided as the irritations were subdued and prevented from operating.

In the *third* place, I would observe, that the symptom presented by this patient of making no complaint and feeling no uneasiness even at the most intense stage of his disorder, is by no means uncommon, and is inconsistent neither with the physiological qualities of the nervous system, nor with its pathological states. In the sound state of the system, and when it is only slightly disordered, with little affection of the nervous system, all uneasy sensations, and all unpleasant impressions, are duly transmitted to the sensorium. As soon, however, as the brain becomes unduly excited by an excessive proportion of blood in its vessels, its natural faculty of recognizing remote impressions is so much impaired, that the consciousness of uneasy sensations and painful impressions is no longer evinced. It hence results that patients with intense affection of the head, complain neither of thirst nor any other natural feeling or painful sensation, where there is no doubt, from the dryness of the tongue and the deranged state of the functions in general, that very uneasy sensations and impressions must be produced. In the present case, the patient felt no uneasiness during the most intense stage of his disorder. When the irritation and congestion of the brain and its membranes, however, had been sufficiently abated by suitable evacuations, he began to complain of thirst and other uneasy sensations.

In the *fourth* place, it is to be observed, that the first amelioration took place on the 9th day, (31st August,) and the decided crisis, when the pulse fell to 52, took place on the 14th day of the disease.

CASE 3. Alexander Boswell, aged 25, a cabinet-maker, reported a person of sober habits, and to have enjoyed good health for many years, was admitted on the 11th of August, with symptoms of fever proceeding to the second stage. He had been exposed to contagion about two weeks previous to admission; but he is unable to specify the exact date of his seizure. He had suffered from languor, sore throat, and cough, for a week previous to Sunday the 9th, when his complaints became aggravated, with the addition of headache, and wandering pains of the extremities, obliging him since that period to keep in bed.

At admission he complained of great pain of the head; the eyes were heavy, dull and sluggish, and not suffused; and the countenance was pale and rather dingy. He complained of occasional cough, with scanty expectoration, and pain at the lower end of the sternum during coughing. He breathed well, however, and lay with equal ease in any position. The tongue was covered with a thin dry fur; he had no appetite, but much thirst. The bowels had been opened by medicine; the pulse was 108, of good strength; and the skin was cool but dry, and without any moisture.

The head was shaved; ten leeches were applied to the sternum; a drachm of the antimonial solution was directed to be given every second hour; and three pills were ordered at bed time, and four ounces of the cathartic mixture in the morning.

Next day, when the leeches had bled freely, and the bowels had been moved three times, the pain both of the head and chest was abated, and the pulse had fallen to 88. The skin, however, had now become hot and dry; there was much thirst; and the tongue was covered with a thin whitish fur

The compound jalap bolus immediately, followed by two scruples of the compound powder of jalap at bed time, and an ounce of the saline ammoniated mixture every hour, were ordered.

Next day, (the 13th,) he had enjoyed no sleep; he complained of some pain of the forehead, and the pulse had risen to 96; and though the bowels had been moved four times, the tongue was covered with a viscid opaque fur.

Eight ounces of blood were drawn from the occipital region by cupping, and the compound jalap bolus with eight grains of calomel was given.

On the 14th, after the evacuations, the headach was much alleviated, and the pulse was 92, of good strength; but the patient had enjoyed no sleep, and the skin was hot and dry. The cold affusion twice daily was ordered; the feet were fomented at bed time; and four ounces of cathartic draught were directed to be given in the morning. On the 15th, when he had enjoyed no sleep, and been rather delirious, with the pulse at 100, and the tongue covered with a brownish dry fur, the scalp was again shaved, and cold water freely applied; and the bolus with eight grains of calomel was ordered at bed time, and five ounces of the cathartic draught in the morning.

Next day, (16th,) the bowels had been moved four times, twice in bed. After a restless night, with much delirium, the temporal arteries were observed to be much distended, the pulse was 116, and the surface of the trunk, especially behind, was considerably mottled with *stigmata*, and *petechiæ;* the tongue also was dry, and swelled. Six leeches were applied to each temple, and a blister to the vertex; and beer was allowed *ad libitum.*

On the 17th, when the blister had risen imperfectly, the state of symptoms was still more alarming. The night had been restless, with much delirium, and some floccitation, which continued. The tongue was covered with a dry glassy fur. The pulse alone was 104, of good strength and regular.

A large blister was applied to the occipital region; four pills, consisting of one scruple of calomel, ten grains of extract of colocynth, and six drops of croton oil, were given in so many hours; and two ounces of wine were administered.

In the evening of the same day, he was quite insensible to all external impressions, but evinced symptoms of consciousness in the morning at one. He continued incapable of understanding or answering questions next day at the hour of visit. The pulse was then 112, of good strength. He had three more ounces of wine, but refused to take the medicine.

A purgative enema with an ounce of oil of turpentine was ordered; the blistered surface was dressed with resinous ointment, and he was to have four ounces of domestic wine daily.

The same evening about ten, he had a slight convulsion fit, but afterwards continued quieter.

He got towards morning four ounces of Port wine. He took drink, and swallowed almost instinctively, but would not show the tongue. The eyes were clearer, but they were much sunk in the orbits, and the features were collapsed, with a dark leaden colour of the complexion. The enema was followed by one motion, and another took place afterwards.

A drachm of compound jalap powder was given; the turpentine enema was repeated; a long blister was applied to the cervical and vertebral regions; and six ounces of domestic wine were allowed.

A good night with some sleep followed; the blister applied to the cervical and dorsal region of the spine having risen well; and the bowels having been moved four times; and next day, the 20th, the tongue was moist at the apex and margins, and the fur giving way; and the patient was more sensible to external impressions, and voided urine consciously. The pulse was as formerly. As he disliked the wine, it was stopped, and one pint of ale daily substituted.

A drachm of the compound jalap powder was given, and the blister was dressed with resinous ointment.

The ensuing night was spent with imperfect sleep and some delirium; and on the 21st the tongue was dry, but he continued to improve in sensibility, the pulse varying from 104 to 108.

During the night of the 21st he enjoyed sleep, and next morning, though the tongue was still dry, the pulse was 88, occasionally irregular; the skin was cool, and the eye and countenance were decidedly clearer. But on the posterior part of the scalp was a black, hard, insensible patch of an elliptical shape, about two inches by one in diameter.

To this an emollient poultice was applied. The jalap bolus with six grains of calomel was given, to be followed in the morning by three ounces, if requisite, of the cathartic draught. An anodyne was ordered at bed-time.

On the 23d, after he had spent a restless night, he was stupid and listless, and the tongue was covered with a dry rough fur; the pulse continued from 80 to 84. The bowels had been freely moved.

The anodyne was continued, with thirty drops of solution of muriate of morphia; and three colocynth pills were given.

A better night followed, and he felt more comfortable in the morning. The pulse, however, had risen to 92, notwithstanding that the bowels had been moved three times. He was again allowed some wine.

He spent, however, a sleepless night; and on the morning of the 25th the countenance was haggard, collapsed, and of a dingy colour; he had slight strabismus, and he complained that he occasionally saw two objects for one. The pulse was 96, quite regular. The tongue was dry and glassy, with much thirst, but it was greatly cleaner.

A glyster was administered. The wine was intermitted till bed-time, when he had two ounces of sherry, after which, with the anodyne, he slept well. On the morning of the 26th, after four motions, the tongue was moist, but covered with a thin fur on the centre; the pulse was 88, soft, and of good strength. He was quite collected, squinted less, and made no complaint of double vision. The slough of the scalp was now separating, and granulations were forming and cicatrizing.

On the 27th, after a good night, he had no complaint but of weakness, and soreness of the scalp, and consequent uneasiness in turning and adjusting the head. The countenance was clearer, and the eyes were less collapsed. The pulse was 72, regular, and of good strength. Though the skin still felt dry, it was extremely moist in various parts. The tongue was clean, but a little glassy; and there was considerable appetite.

On the 30th, when the appetite was good, the tongue clean, and the pulse at 68, he was allowed common diet.

After this time he continued to improve slowly but steadily in strength and appearance, requiring chiefly attention to the diet, the excretions of the alimentary canal, and the sore of the scalp. The latter soon healed. On the 15th of September he was still feeble, but in all respects well; and after taking a bottle of ale daily, he left the house well in a few days.

Though this was not the only case in which the symptoms assumed an appearance so unfavourable, yet without proceeding to the fatal termination, it deserves, I conceive, particular attention, from the manner in which the symptoms were complicated with those of affection of the head and spinal chord, and from the advanced stage at which the patient came under treatment.

It may be observed that, at the period of admission, the first stage of the disease, so far as the cerebro-meningeal affection was concerned, was nearly over; and consequently the probable effect of much or active depletion was rendered doubtful, if not positively detrimental. Although, therefore, the symptoms seemed manifestly relieved, yet they continued in a modified form, and eventually became much more formidable, threatening effusion and comatose death. Thus on the 17th, which corresponded to the 15th day of the disease, he became quite insensible and unconscious, had a convulsion fit the following night, and passed urine and fæces unconsciously and involuntarily. These symptoms could not have been produced by effusion of fluid into the sub-arachnoid tissue or ventricles; otherwise the fatal termination must have taken place, as there seems no reason to believe that fluid once effused in these situations is absorbed. It is more consistent with correct physiological principles, and all the facts of pathological anatomy, to infer that these symptoms were induced by the irritation and compression occasioned by an undue quantity of slowly moving, perhaps almost stagnating and unrespired blood, in the vessels of the brain and its membranes. That such a state of the vessels does take place, we have sufficient evidence to believe in the phenomena afforded, not only by cases of fever similar to the present, but by those of that form of *meningitis*, as it occurs in infants and adults, which gives rise to water in the brain. In several of these cases which I have inspected after death, though *strabismus*, double vision, and convulsions, took place during life, no effusion was found in the ventricles, and very little in the sub-arachnoid tissue; and I have seen, even after *strabismus*, and double vision, and convulsions, recovery effected under the use of proper remedies.

Besides the suspension of the cerebral functions by the retarded circulation of the brain and its membranes, in such cases as the present, another cause concurs powerfully to derange the cerebral and meningeal circulation. This is the too long-continued presence in these vessels of blood which has not undergone, by circulation through the lungs, the change requisite to maintain its healthy and normal action upon the organs in general, and the brain in particular. In fever the lungs and bronchial membrane partake in the general disorder; and the effect of this is to impair so much the circulation through the pulmonary artery, as not only to allow the blood to be sent, imperfectly oxygenated, to the left chambers of the heart, but at the same time to impede the general motion of the blood from that organ back to the lungs. I have already shown in my former Report, that this is one principal cause of the peculiar dingy appearance of the surface in fever patients during the second stage of the disease; and in the case of Boswell, it was evidently evinced in the dingy leaden colour of the countenance and surface generally, the dull appearance of the eyes, and the final tendency to gangrene, as shown by the mortification of part of the scalp, on which the head rested during the period of greatest insensibility and feebleness of the locomotive powers.

In the *third* place, we may remark in this case, what is almost invariably observed in many, if not all, cases of fever, that the procees of fever undergoes certain oscillations or slight transitions between improvement and deterioration. The removal of the patient on the 11th from his own abode to the hospital, appears, in the first instance, to have rather aggravated the symptoms, which then on the 12th underwent some amelioration, whether from the influence of remedies, or the natural course of the disease, it is not easy to determine. On the 13th, however, he was much worse; on the 14th better; on the 15th worse; and on the 16th, 17th, and 18th worse, till the night of the 19th, (17th day of the disease), when the symptoms were again alleviated. On the 22d, (20th day) and the 25th (23d day) the symptoms were again aggravated; and it was only after the night of the 26th, that the symptoms of affection of the brain and its membranes became so much moderated, that he could be considered in a less dangerous state.

In the *fourth* place, it seems necessary to observe, that, in this case, the state of the symptoms required the union of measures of evacuation, with cautious and careful employment of means of support. With the evacuation by leeches and cupping, and cathartics in pretty active doses, and the revulsion produced by blisters, it was necessary to continue the exhibition of small quantities of wine, and afterwards of ale. Such combination of remedies is not unfrequently required; and their indication arises from the peculiar pathological state of the vascular and nervous systems in fever,—a state which, I have already in last Report attempted to explain, and upon which I need not dwell further at present. It may be sufficient to observe, that the combination requires the utmost vigilance and circumspection on the part of the medical attendant, in order to insure its favourable influence, and to prevent it from being detrimental.

II. Of the cases that terminated fatally we procured inspections in ten only; and of those which were inspected by me, two were treated by my predecessor in the wards. But even of this small number it is unnecessary, and would be tedious to detail all; since in many circumstances the appearances were similar. I shall, therefore, select a few in which the lesions were either so important as to deserve especial attention, or were in some manner connected with the symptoms during life.

Case 1. John Gray, aged 12, admitted 2d December, and died on the 8th, being the 12th day of the disease. The leading symptoms were affection of the head, eyes, and brain, with petechial eruption on the skin, much thirst, and obstinately furred tongue; and some uneasiness and fulness in the epigastric region. The treatment consisted in leeches applied to the head, cold to the shaven scalp, cathartics, the saline mixture, and latterly some wine.

Inspection disclosed the following appearances.

The *pia mater* was very vascular and much injected; some fluid was effused into the sub-arachnoid tissue, and some into the cavity of the ventricles. The substance of the brain, however, was not particularly vascular, and it was natural in consistence.

The left lung adhered at its upper part to the costal *pleura* of the apex of the chest. Both lungs presented posteriorly much congestion and vascular distension, but were otherwise healthy in structure. The bronchial membrane was much reddened, and the bronchial tubes and vesicles contained much blood-stained frothy mucus.

The stomach was distended with some air and fluid; and a considerable mass of coagulated milk,—as large as a small apple, was found lying in the cardiac and splenic region. The mucous membrane, especially at this part, was of a deep red colour, and extremely vascular; and the vascularity continued for several days after death.

The intestines were rather distended with air. All the other organs were healthy, except the lower part of the *ileum*, in which the agminated glands of Peyer were enlarged, prominent, and somewhat vascular. One patch, presenting the mucous follicles in this manner hypertrophied, extended several inches upwards from the ileo-coecal valve.

At the *ileum*, about one-fourth from its lower extremity, was found a *diverticulum* five inches and a-half long, one end of which was attached by a long ligamentous process to the mesentery.

In this case, the most remarkable morbid appearance, next to those of the brain, consisted in the extreme redness and vascularity of the mucous membrane of the stomach. It must be observed, nevertheless, that though this boy presented the usual fulness and slight soreness at the epigastrium common to all fever cases, he manifested no complaint corresponding to the intensity of the redness and vascularity found after death. It appears to me that this absence of complaint is to be referred, not to absence of disorder of the mucous membrane of the stomach, but to the torpid and inert state of the nervous system, in consequence of the simultaneous oppression of the brain.

There is some reason to believe that the redness and vascularity was, in this case, if not excited, at least maintained, by the quantity of milk drank by this boy. This is the worst and most indigestible species of food for fever patients; and though it is generally prohibited, unless diluted, or in small quantities, the nurse, at the urgent solicitation of the patient himself, had allowed him to take it almost as freely as he chose.

In the following case, the affection of the mucous membrane of the stomach was still more intense.

CASE 2. George Cuddie, tailor, aged 50, admitted on the 13th of April, had been exposed on the 8th, and began to complain soon after of general soreness, headach, and debility, and subsequently laboured under indistinct speech and constant muttering. He was insensible at admission, muttered much, and was delirious The face was suffused, the temporal arteries distended, and the surface of the body, especially behind, was mottled and spotted. The delirium and incoherence continued and increased, notwithstanding the use of all the most appropriate remedies, till the morning of the 16th, when coma terminated in death at 9 A. M.

This man was much deformed, and had laboured for years under loss of power of the lower extremities.

Inspection of the body 26 hours after death disclosed the following appearances in the different organs.

Head.—A considerable quantity of serous fluid was effused into the sub-arachnoid filamentous tissue; the *pia mater* was much and minutely traversed with red vessels, generally large; and on the upper surface of the right hemisphere appeared a florid red patch, which consisted of serum reddened by blood from many small vessels. The arteries of the brain were generally distended with dark-coloured venous blood; and the sinuses were comparatively empty. The cerebral substance was of a pale rose-red colour, and exhibited transverse bloody streaks and spots. The lateral ventricles were dilated with *serum.* The *foramen* of Monro was patent; but the *septum lucidum* was entire. Much fluid was effused at the base of the brain.

Chest.—The upper part of the right lung adhered to the *costal pleura* of the apex of the chest, with some solidification and condensation of its tissue in this region; and in the centre of the condensed portion was found a mass of steatomatous or putty-like matter, enclosed within a cyst or capsule.

The *pericardium* contained about three ounces of serum. The heart appeared smaller than natural. The substance of the parietes of the left ventricle was firm and thickened, with diminution of the capacity of the chamber. The semilunar valves were in some degree indurated; and the mitral valve was thickened, cartilaginous, and contained a bony point.

Abdomen.—A dark slate-gray discoloration, with preternatural softening, was found in the mucous membrane of the dorsal wall of the stomach, extending in the transverse direction of the body, and longitudinal direction of the organ. In other parts, the mucous membrane was preternaturally vascular, and exhibited many minute red points.

The mucous membrane of the lower part of the *ileum* was injected; and the solitary glands of this, as well as of the upper bowel part of the colon, were reddened and slightly elevated.

The kidneys were lobulated; and they, together with the other abdominal *viscera*, were congested with dark-coloured venous blood.

In this case, the pathologist will observe not only the marks of serious meningeal affection, but that of a gastric disorder; and he will also not overlook the fact, that the patient had been phthisical, and that the apex of the right lung contained a consolidated cavity; and that the heart was affected with concentric hypertrophy.

This inspection affords an instance of an omission, involuntary, indeed, but very important. The spinal cavity was not examined, in consequence of the relatives objecting.

In this case, we perceive not only the influence of fever in destroying the vital energies of the organs, but the effects of morbid states of the organs in contributing to that result. In the following case, which, though not treated, was inspected by me, the same class of facts is still more clearly illustrated, and we see besides the effect of death of the brain on death of the lungs.

CASE 3. Robert Grainger, butcher, aged 55, was admitted on the 7th October 1834, with symptoms of fever of seven days' duration. The pulse varied from 110 to 96 and 98; he had at first much headach, of which afterwards he did not complain; and he was reported as convalescent on the 15th. The tongue, however, was still furred; the pulse was never below 98; and he had a languid, oppressed, haggard look, which indicated that the circulation was not moving in the proper channels or in the right direction. He had been allowed some wine, which was suspended on account of cough, and again resumed. On the 8th November the cough was worse, and continued daily on the increase, interrupting sleep. On the 12th, it was attended with subcrepitous rattle in the centre of the left lung, and sonorous *rhonchus* on the right side, with respiration at 32, and pulse at 108; while the tongue was red and dry, but covered with transparent glassy mucus. These symptoms were attempted to be controlled by giving up the wine, and giving opiates and antimonials and the squill mixture. All, however, was unavailing. On the 14th November, the cough and dyspnœa were particulary distressing, with mucous rattling in the bronchial tubes of both sides, but especially the right, and causing livescence of the lips, and a general bloated appearance of the countenance. On the evening of the same day he became lethargic, and died next morning at one.

Inspection disclosed the following state of the different organs.

Heud.—A considerable quantity of serous fluid was effused into the sub-arachnoid tissue, separating the arachnoid membrane from the *pia mater*, and giving it a gelatinous appearance. Both ventricles were found distended by a copious effusion of limpid *serum*, amounting in all to about four ounces.

The posterior *cornu* of the left ventricle was peculiarly elongated, reaching to within half an inch of the convoluted surface. The *fornix* was elevated; the *corpus callosum* much stretched; and the *septum lucidum* was posteriorly perforated by an irregular opening of about one-third of an inch in diameter. Parts of it were much macerated. The *foramen Monroianum* was more distinct than natural. The arteries of the brain were distended by semifluid blood, while the veins were empty, with the exception of the lateral sinus, which contained dark-coloured blood.

A few steatomatous deposits were observed in the tunics of the internal carotid and basilar arteries. Much serous fluid flowed from the spinal canal.

Chest.—The lungs were much collapsed. Adhesions of old standing connected firmly the right lung to the middle and upper part of the parietes of the chest. At the upper part its substance was much condensed, and contained a chalky deposit. The corresponding *pleura* was puckered and tendinous. The apex of the left lung showed the same appearance, though to a less degree. The posterior regions of both lungs were much gorged; and the bronchial tubes contained much frothy serum and a little viscid mucus. The left ventricle was thickened and indurated. Patches of steatomatous deposits were observed in the semilunar and mitral valves.

Abdomen.—The right kidney was considerably smaller than the left, and presented near its upper part an amorphous mass of gray and red substance, partly soft and partly hard. The tubular and cortical matter in the neighbourhood were found to be completely absorbed. The *infundibula* were much enlarged. The right ureter was much distended for about an inch downwards, where it became much contracted from thickening of its coats.

The other *viscera* were sound.

In this case, though the affection of the chest appeared during the latter stage of the disease to be the most prominent, there was every reason to believe that it was not idiopathic, but secondary, and the effect, in a great degree, of the oppressed state of the brain. It is impossible to imagine that the quantity of fluid found in the ventricles and in the texture of the membranes of the brain, could have been effused a day or a few hours previous to the fatal issue. It is more reasonable to think that the effusion must have begun to take place from about the second week of the disease, and continued to proceed the whole time that the man was under treatment.

It is remarkable that this man's tongue never became clean, or assumed a healthy appearance, nor did his pulse fall below 98 or 100. In all cases in which these two symptoms of quick pulse and furred tongue continue together, I have observed that the circulation of some important internal organ is in an unhealthy state. But in this case it was besides observed that neither the skin became moist and warm, nor did the urine assume a natural appearance, the latter being scanty and turbid, or preternaturally clear.

Not only did this effusion contribute to abate the energy of the brain; but the state of vessels from which it arose, and the state of vessels to which it in turn gave rise, must have concurred powerfully in abating, impairing, and even extinguishing the energy of the brain. Though this state, therefore, might continue for some time without causing much injury to the function of the lungs, it could not fail to do so at length. Accordingly, we find, that the disorder of respiration came on very much like that which results from previous disease of the brain and nerves, and bore a close resemblance to that which takes place in animals in which the pneumogastric or tenth pair has been divided. The latter stage of this man's case presented very much the symptoms of the peripneumony of the last agonies remarked by Le Gallois, Nysten, and others, who have watched in the lower animals the effects of injuries of this nerve and the parts of the brain with which its origins are connected.

The cases admitted during the period referred to, presented more than one example of the effects of intoxication and habits of irregularity in disposing to the invasion of fever, and concurring to produce its fatal termination. There were at least two cases in which a blow on the head was represented to have been combined with the cause now specified in contributing to the same result. One of them which was most characteristic I may detail.

Case 4. David Henderson, aged 22, a labourer, was admitted on the 11th June, with the usual symptoms of fever, rather intense. On Thursday, the 28th May, this man received on the right side of the head from a heavy chain a blow by which he was knocked down, and remained insensible for a minute or two. Headach continued the rest of the day, though he persevered in working; and in the evening he had some vomiting. Next day he persevered in working; but the headach continued to increase till the forenoon of the following day, when he was attacked by rigors, with much debility and languor. After this period he was unable to quit his bed. The headach had been relieved by a fit of epistaxis, and afterwards by a blood-letting from the arm; the blood drawn from which was not buffed. He had slept little, was very thirsty and hot, and had complete *anorexia*. The face was flushed; but he had neither ringing of the ears, intolerance of light, nor disordered vision. The skin was covered by florid petechial spots a little raised.

The treatment consisted in local bleeding from the head by means of leeches repeatedly applied; cold applied to the shaven scalp; blisters; antimonial solution, and cathartics. He died on the 16th of June, the fifth day after admission, and about the 19th day from the infliction of the blow.

Inspection disclosed the following appearances.

Head.—The *dura mater* was separated with unusual facility from the petrous portion of the temporal bone, especially on the right side, and also from the cuneiform process of the occipital bone, which was further found red and rough. A considerable quantity of serous fluid was effused into the sub-arachnoid filamentous tissue, all over the hemispheres and at the base of the brain. The *pia mater* was unusually vascular, and its veins contained red semifluid blood.

The convolutions in the parietal region of the right hemisphere were slightly but perceptibly flattened; and the substance of the brain, in the same region, presented a larger proportion than usual of red vessels effusing dark red fluid blood. The ventricles contained between them one ounce of serous fluid, and were considerably dilated.

The *cerebellum* presented nothing unusual. But a considerable quantity of turbid fluid escaped from the cavity of the spinal chord. Much fluid blood escaped from the sinuses of the *dura mater;* and all the branches of the internal carotid and basilar arteries were distended with dark-coloured semifluid blood.

Chest.—The lungs presented interlobular adhesions, and a short adhesion connected the inferior left lobe to the diaphragm. The substance of the lungs was inelastic, and uncrepitating; and much bloody serum, mixed with froth, escaped from incisions. The margins of the lungs were emphysematous.

The bronchial tubes were filled with viscid frothy mucus, of a faint red colour, upon the removal of which the bronchial mucous membrane was observed of a reddish-brown colour.

Fibrinous clots were found in the branches of the pulmonary artery. The heart was healthy.

Abdomen.—The spleen weighed eleven ounces, and was reduced to a soft reddish-coloured pulpy mass, without organisation.

The tissues of the stomach were thickened; and the mucous membrane presented much adherent mucus, on the removal of which, the submucous tissue was observed to be much loaded with vessels giving the appearance of *ecchymosis.* The mucous membrane of the splenic portion was distinguished from that of the great curvature by a well marked visible line; and though the former was not positively softened, it was not in the natural state presented by the latter.

The lower extremity of the *ileum* presented several reddish elevated bodies like hypertrophied follicles. The mucous membrane of the *caput cæcum* presented several ecchymotic patches of a brown red colour.

The liver and kidneys were sound.

In this case it will be remarked, that, besides the indications of meningeal inflammation, there were traces of lesion of the gastric mucous membrane, and especially of the spleen. The lesion of the latter organ I have found to prevail in a considerable proportion of the cases examined; and while I think it an organ which more readily yields to the disorganization produced by the febrile congestion than any other, I am disposed from these cases to infer, that its lesion is not only a frequent cause of unfavourable symptoms, as hiccup, vomiting, enduring epigastric pain, but may give rise to softening of the stomach, and tends very readily to induce the fatal termination. In the following case, besides the usual affection of the nervous system, in a very intense form, the spleen was disorganized, and the mucous membrane of the stomach was completely destroyed.

Case 5. John Orr, aged 26, was admitted on the 21st of March, in a state of insensibility bordering on idiocy, and complete extinction of the mental faculties. The eyes were not suffused, but a little turned up, and heavy, with dilated pupils; the countenance was dull, the complexion leaden-coloured and dingy, and he had so much spectral illusion, and violent delirium, that the symptoms were ascribed by some to *delirium tremens.* The skin was damp and leaden-coloured; the epigastric region was swelled and tender; the tongue was furred; the pulse at 80, soft; and the patient, who was reported to have been given to drinking, repeatedly demanded spirits with great importunity.

He was confined to bed on the previous Friday, the 13th; but he was quite unable to give a distinct account either of his past or present feelings, and muttered incoherently and inarticulately.

The head was shaved, some cathartic medicine was ordered, and the cold affusion was directed to be employed according to its effects.

In the evening he became very furious and unmanageable, but was rendered calmer after the use of the affusion. The bowels had been three times moved. But (22d) the epigastric and umbilical region was tense, swelled, and caused pain when pressed, though he was otherwise nearly insensible to external impressions. The pulse was 86.

Eighteen leeches were applied to the epigastric region, and mild laxatives were continued.

Next day, (23d,) though the leeches had bled freely, the tongue was very glassy, dry and swollen; the epigastric region still tense, and gave pain when pressed; and the pulse had risen to 100, and was rather small and feeble. The bowels were reported confined.

A scruple of calomel and ten grains of colocynth were divided into three parts, each of which was administered at the interval of one hour.

In the evening he seemed so weak, that an ounce of wine was given every hour till he got eight ounces; and, as the extremities were cold, sinapisms were applied. The pulse was 84 next day, and he seemed more collected; but the epigastric region was as tense and tender as before. The surface when struck emitted a tympanitic sound.

Some compound powder of jalap was given, and the wine was continued at the rate of one ounce every third hour.

He enjoyed a quieter night, and three motions had taken place; but on the morning of the 25th he complained, the first time spontaneously, of great soreness in the epigastric region. It was still tense and tympanitic, and caused, when pressed, much pain, and there was even pain in the left hypochondriac region. There was dulness on percussion in the right hypochondriac region, to the right of a line drawn from the right side of the sternum towards the *umbilicus.* All elsewhere it emitted the clear tympanitic sound. Some vomiting had taken place in the morning. The tongue was red, swelled, glassy, and covered with a dry fur on the centre. He had some cough, but no unnatural sound. The incoherence was less marked; but insensibility was increasing.

An enema containing an ounce of oil of turpentine was administered; the effervescencing draught was given; and instead of the wine, a small quantity of spirits, at his urgent solicitation, was allowed.

The tympanitic distension was slightly abated after the operation of the enema; but the other symptoms continued rather on the increase, and he died on the evening of the 25th.

Inspection presented the following appearances.

A great quantity of fluid was effused into the subarachnoid tissue; and about from one ounce to an ounce and a-half into the cavity of the ventricles. The *pia mater* was extremely vascular, and its vessels were distended with brownish dark-coloured blood. All the arteries were distended with dark-coloured gory blood; and the large sinuses were empty.

The lungs presented a few old adhesions, and some emphysematous patches at their margins.

The heart was slightly enlarged, especially in the left ventricle, the walls of which were of natural size, but the chamber of which was considerably dilated. The mitral valve was thickened and penetrated with osseous matter, and the aperture was much contracted. The semilunar valves were slightly ossified and rigid; and patches of osteo-steatomatous matter were deposited upon the proper tissue below the inner membrane of the aorta.

The stomach was very much distended with air, and occupied an unusually large portion of the epigastric and left hypochondriac region. Upon cutting it open, and removing the contents, which consisted of a dark-coloured vinous-smelling fluid, a large space of the mucous membrane, at the large *cul de sac* or splenic region, was of a slate-gray colour passing to blue, completely softened and pulpy, and coming away in loose shreds and filaments upon the slightest touch. Even the affusion of water washed off this pulpy softened mass, and left exposed the submucous filamentous tissue, with the muscular coat attenuated, and traversed by blood-vessels, and presenting patches and spots of coagulated blood. The shape of this softened portion was irregular; but its outline was well-defined and distinctly marked. The mucous membrane of the pyloric end was slightly reddened, mottled and mammillated, but not softened, and presented the usual characters of the gastric mucous membrane.

The blood-vessels of the stomach, especially the *gastro-epiploica sinistra*, and its branches, were large, and distended with dark-coloured semifluid blood.

The spleen was about the usual size; but its substance was converted into a soft pulpy mass of a violet red colour, without the slightest trace of organization. The outer membrane alone was left unaffected.

The liver was rather larger and firmer than usual.

The mucous membrane of the *duodenum* was rough, granular and firm.

In this case candour obliges me to say that the calomel and the wine were both, in all probability, injurious. The tenderness and tension of the epigastric region led me to suspect a serious affection of the stomach, and to order local bleeding from the vicinity of that organ; but there was reason to believe that, at the period of admission, the lesion of the coats of the stomach had been too far advanced to admit of relief from any remedy, much less recovery. The man had been eight days unwell before he was brought to the house; and if the disorder of the stomach and spleen commenced with the fever or soon after its invasion, it is easy to see, that, where nothing was done but the administration of distilled spirits, it was physiologically impossible for these organs to withstand so intense a perversion of action.

I ought to mention, that in examining the chest of this man by the stethoscope, I found the beat of the heart very clear, and diffused over the chest, with bellows sound, unusually strong impulse, but a throbbing jarring thrill in the contraction. No irregularity was recognised. Nor could we obtain any history of his feelings or usual state. These signs, with the small state of the arterial pulse, led me to prognosticate disease of the heart, and probably of the semilunar valves. It proved to be in the mitral principally. It is remarkable that, in persons who have the pulse irregular during health, it becomes quite regular during the time of fever, and continues so till the fever subsides.

A case similar in some respects in the lesion of the stomach and spleen, was the following.

CASE 6.—Robert Cowie, aged 45, cabinet-maker, was admitted on the 23d May 1835, with a pale oppressed look, the tongue covered with a white viscid fur, the pulse at 110, inability to maintain the erect position, and complete *anorexia*. He had *nausea* with headach two days previously; but the latter was at admission gone, and in its place were *vertigo* and faintness.

About two weeks previous his wife died of an attack of fever; and at the period of admission, two of his children were in the hospital under the disease.

The disease proceeded, notwithstanding the use of all the usual remedies calculated to abate its intensity, with flushing of the countenance, distension of the temporal arteries, furred tongue, pulse from 104 to 116, sleeplessness, and eventually delirium, floccitation (*carphologia,*) spasmodic closure of the eyelids, and difficulty of deglutition, with pulse at 148, till the morning of the 31st, when death took place.

Inspection on the 2d June disclosed the following appearances in the three cavities.

Head.—The *dura mater* was firmly adherent to the skull, and required to be detached by force. The *pia mater* was very vascular. The fluid effused into the sub-arachnoid tissue was moderate; and a small quantity of fluid only was found in the ventricles; which, however, were considerably dilated.

Chest.—The bronchial tubes were filled with frothy and bloody or brownish-coloured mucus, upon removing which, the bronchial membrane was seen much reddened and embrowned. The lungs, especially at their posterior region, were much gorged with dark-coloured semifluid blood.

The heart was natural in dimensions and appearance, but contained clots in the right auricle, ventricle, and pulmonary artery. The left chambers were almost empty.

Abdomen.—The mucous membrane of the stomach was thickened, dark-coloured, and very much tinged with blood towards the cardiac end. There was, however, no distinct softening or destruction of the coat.

The mucous membrane of the *duodenum* was granular and irregular.

The spleen was very large, and its substance was much softened.

This case illustrates, further, the general action of fever, by its universal affection of the capillary system of all the organs in every region of the body.

An instance of a similar lesion, with disease of a greater number of organs, as taking place in a person further advanced in life, is given in the following case.

Case 7.—John Kerr, baker, aged 56, reported to be a man of sober and industrious habits, was admitted, on the 14th of August 1835, with symptoms of fever, represented to be of fourteen days' duration. The leading symptoms were pain in the frontal region of the head, ringing in the ears, pain in the sternal region on motion or on deep inspiration, squeamishness, loss of appetite, much thirst, furred, dry, and tremulous tongue, unsteadiness of the muscular motions, the pulse at 92, small, and heat of the skin, which, in the posterior part of the trunk was covered with a distinct, copious, florid, spotted eruption.

He had resisted the symptoms by persevering in working for eleven days; but on the twelfth he was obliged to desist, and keep his bed.

The treatment consisted of one local bleeding from the head by means of leeches at admission; two blisters afterwards, according to the indications; the saline mixture; cathartics during the whole course of the disease, chiefly in the morning; antimonial opiates at bed-time; and porter, and afterwards wine, in moderate quantity.

After the 16th day the pulse rose to 104 and 112; the tongue continued furred and dry; the nights were sleepless; the feebleness increased; and the eruption did not subside or improve in colour. The night of the 20th was spent in typho-maniacal muttering, the urine was voided unconsciously, and the extremities were cold. Sinapisms to the legs, and a blister to the epigastrium were applied; but he continued to sink, and died at half past five on the morning of the 22d.

Inspection on the 23d disclosed the following appearances.

Head.—The membranes of the brain were thickened, with considerable effusion of serous fluid into the sub-arachnoid tissue. Fluid was contained in the cavity of the lateral ventricles; and the substance of the brain generally, but especially the *septum lucidum*, was infiltrated and slightly softened. The cerebral *nucleus*, or the centre of the *corpus striatum* and optic *thalamus*, and the *corpus dentatum* of the *cerebellum*, were very vascular, and the vessels loaded with blood. The other parts of the brain less so. The arteries of the brain were distended with dark-coloured blood. The state of the veins was not ascertained.

Much serous fluid flowed from the spinal chord when it was divided.

Chest.—The lungs were of a dark-red colour, very soft, and much loaded with grumous dark-coloured blood. The bronchial tubes and pulmonary vesicles effused bloody and frothy serum when divided.

The whole heart was soft, flaccid, and lacerable. The right ventricle was large, loose, and flabby; and its inner membrane was deeply stained with the colour of a few loose clots which it contained. Both auricles were distended. The left ventricle was of moderate size, but soft, and deeply tinged with blood.

The semilunar valves were hard and cartilaginous; and the aorta was sacculated, and formed a pouch at its arch.

Abdomen.—The liver was light-coloured and lacerable.

The spleen was a dark-coloured soft pulpy mass, homogeneous, and without trace of organization, except a few filaments proceeding from the external tunic.

Over a large space of the cardiac end of the stomach the mucous membrane was reddened, softened, and pulpy; and on being removed in various parts, it presented the submucous filamentous tissue uncovered and exposed. This portion of softened and destroyed mucous membrane, a distinct line of demarcation separated from the healthy portion of the membrane at the middle, on each side of the small arch, and towards the pyloric end of the organ, in which it presented its ordinary healthy appearance, and was of a slate-gray colour.

The intestinal mucous membrane was natural in general; but the aggregated follicles were prominent, distinct, and enlarged.

The mucous membrane of the kidneys and ureters was injected and reddened in patches; and the *pelvis* of the left kidney was much distended with urine.

The tissues of the bladder were thickened to the extent of a quarter of an inch; and its inner mucous membrane was hypertrophied, and elevated into *fasciculi* or bands, by fasciculation and hypertrophy of the muscular coat.

The prostate gland was enlarged and indurated above and below, but elastic and compressible on each side; and much thick foul ash-coloured puriform mucus issued on pressure from the ducts on each side of the *Caput Gallinaginis.* On laying open these by means of the knife and probe, it was found that on each side of the gland, one or more of the blind ends of the ducts had been distended into a cyst of some size, so as to form a cavity containing the foul purulent mucous fluid, which was discharged from the ducts by means of pressure.

The history of this patient furnishes an example of one of those cases commonly called broken constitutions, to which often no very definite idea is attached, but which, when accurately examined, always resolve themselves into disease of one or more organs of the economy, for instance, diseased heart, diseased liver, diseased spleen, diseased kidney, or diseased bladder or prostate gland. In this instance, there was disease of the heart, disease of the liver, disease of the spleen, and disease of the bladder and prostate gland. That of the stomach was, in all probability, the effect of the febrile action.

After these necroscopical reports, and it must be superfluous to adduce others to the same effect, if it be not easy to understand the fatal termination of fever cases, it must be at least not difficult to see, how, under such circumstances, recovery must be physiologically impossible. To this subject, I had formerly alluded, generally, in my former Report, with the hope of adducing more pointed evidence on the subject at a subsequent occasion. This, I trust, I have now in part accomplished by the facts disclosed in the necroscopic reports now submitted. On these I might adduce some physiological and pathological comments, not altogether void of utility; but I feel that the cases speak pretty distinctly for themselves, and afford on the nature and tendencies of fever, and especially on the organs of the persons whom it selects for subjects, lessons which cannot fail to make a deep impression on the pathological physician. These cases show that the fatal termination depends not so much upon the affection of one, as of several organs; and not so much on the febrile disorder itself, as on the previous state of the organs of the patient; and that fever, though a general affection of the whole capillary system in every organ of the body, derives sometimes a peculiar character from the state of certain organs.

One important question is necessarily suggested by such cases as those now detailed. Does the febrile disorder give rise to the affection of the mucous membrane of the stomach, and the softening of the spleen; or, are these lesions accidental complications taking place in certain individuals, and depending upon the operation of causes applicable to some individuals only? It is evident that these lesions are not uniform, since they do not take place in all, or even probably in the majority. It is nevertheless manifest, that, when they do take place, they are almost invariably, we may say, uniformly, fatal; since it is impossible to conceive life to be continued with such a state of the gastric mucous membrane, or of the substance of the spleen, as we found in the cases now recorded.

One question only I would propose, in reference to this species of lesion. Is it consistent with sound physiological or pathological principles to expect, that either wine, or spirits, or similar stimuli can be beneficial? Is it not reasonable to think rather that they are invariably detrimental?

In the foregoing details, it must appear extraordinary to those who are acquainted with the recent literature of continued fever, that though we have several examples of fatal fever, with lesion of the mucous membrane of the stomach, and softening of the spleen, and sometimes enlargement of the intestinal follicles, we have almost none of distinct *enteritis* or *dothinenteritis*, which has been so commonly observed elsewhere. In the whole of the cases treated by myself, there was not one in which the follicles were so much diseased as to justify particular importance being attached to it. The only one in which I recognized ulceration, though inspected by me, was treated by my predecessor in the wards. Its history is the following.

Case 8th. Thomas Fox, aged 19, was admitted on the 20th October 1834, with pulse at 110, dry tongue, hot skin, heavy injected eye, and numerous bright-coloured, large-sized petechial spots. During the night he was delirious, and without complaint of headach; and on the 21st, the tongue was covered with a thick black fur; and the pulse was 108. Half an ounce of castor oil was given, and the camphor mixture every third hour was ordered. The delirium, without pain of head, continued; the tongue was still black and dry, and the skin hot; the pulse had fallen to 96, and the bowels had been moved. The head was shaved and a blister applied, and some beef-tea was allowed. The symptoms were much the same; and on the 23d, an ounce of wine every third hour was ordered. The delirium was abated on the 24th; but the other symptoms were the same, and the pulse was 120. On the 28th the fur on the tongue began to give way. But on the 29th the countenance was flushed, the voice was hoarse and feeble, he complained of pain of the throat, and difficulty of deglutition, and some diffuse fulness with tenderness of the surface was recognized at the left angle of the jaw. The wine was diminished in quantity. On the 31st the left cheek and angle of the jaw were much swelled and painful, with tenderness and redness of the surface; the pulse was 136, small and sharp; and the respiration was 56 in the minute, with the sonorous *rhonchus* heard in the chest.

A poultice was directed to be applied to the tumour; and fomentations to the lower extremities; and six grains of calomel with four of James' powder were directed to be administered immediately.

The pain was alleviated during the night, and on the morning of the 31st the swelling had subsided. But the red colour continued to spread along the integuments of the neck, extending from the left to the right side, with a tinge of violet. The breathing became slower but more laborious, and he continued to sink till half-past eleven, when death took place.

Inspection of the body presented the following appearances. The membranes of the brain were very vascular and much injected; and much fluid was effused into the subarachnoid tissue, both above and at the base of the brain, and on the spinal chord. Some fluid was also found in the ventricles; and the substance of the brain was everywhere highly vascular.

The lungs were void of adhesions, and little fluid was found in the cavity of the pleura. The lower lobe of both lungs was firm, dark-coloured, condensed, and greatly gorged with blood and bloody serum.

The mucous membrane of the stomach and small intestines was slightly reddened. The aggregated glands of Peyer at the lower end of the *ileum* were unusually prominent, enlarged and roughened; and several had proceeded to the formation of ulcers, the surface of which was red and rough, and the edges of which were vascular, prominent and irregular. The glands, both aggregated and solitary, were, about from two to three feet up the *ileum*, in like manner elevated, enlarged and reddened, but not ulcerated.

The other organs were in a natural state.

In this case, it may be observed, that during life the symptoms had not given any indication of the follicular disease, which was found in the intestines after death. There had been no diarrhœa or ochrey-coloured stools, which are conceived to be the indications of this disorder of the ileal mucous membrane and glands, nor had there been any unusual tension or tenderness in the right iliac region. As to pain, that was not to be expected; for I have repeatedly observed, that during the process of idiopathic fever, all the textures lose so much of their proper innate sensibility, that considerable lesions, both dynamic and organic, which, in states of the system not accompanied with continued fever, give rise to manifest symptoms, may take place without inducing any particular uneasiness or characteristic symptoms. The sensibility is so much impaired from general atony of all the textures, and particular *inertia* of the nervous system, that the characteristic effects of these lesions are not uniformly developed; and when they are, the brain or sensorium is inadequate to take cognizance of them.

It appears to me an important question in this case, to ascertain whether the follicular disease of the intestinal mucous membrane had preceded, or had accompanied or followed the febrile attack. From the fact that this was the only instance of distinct follicular disease in twelve cases of dissection, it manifestly results, that it is not necessarily connected with the febrile disorder. According to the account received of the case, the attack commenced on the 17th of October, and, as the fatal termination took place on the 1st November, the whole course of the disease occupied fourteen days. It would, therefore, come to be inquired, whether, in the course of this space, the intestinal follicles could become enlarged, inflamed, and ulcerated. From what I have seen of this disease in adults under other circumstances, I am inclined to believe that it could not, and that the affection of the ileal follicles must have been of previous, perhaps remote origin. At the same time, it is necessary to mention, that from the history of the patient, nothing could be learnt which was either favourable or hostile to this idea.

If the follicular disease really preceded the febrile attack, it is certainly remarkable that it was not aggravated by the use of cathartic medicines, which are generally believed and represented to be capable either of exciting, or aggravating this disorder when excited. Little doubt, however, can be entertained, that the circumstance of this disorder of an organ, the integrity of which is essential to life, must have contributed to the occurrence of the fatal event. I have already observed in my former report, that there is good reason to believe that the lesion of one or more organs has a powerful influence in aggravating the symptoms of fever, and in giving the disease a formidable, sometimes a fatal character.

III. I have now only to conclude with a general view of the results obtained in the management of the total number of cases; and to deduce such general conclusions as a careful view of these cases is adequate to furnish.

From the preceding tables it appears, that the number of cases of fever which have come under treatment, from October 1834 to October 1835, has been 174. Of these, the event has proved fatal in 24, giving a proportion of exactly 1 in 7¼.

Among the whole number, only 65 distinctly traced the origin of the disease to contagion; 31 attributed it to exposure to cold; and the remaining 78 could assign no cause for their complaints.

The day of the disease on which the patients were admitted was extremely various; and, as will afterwards be shown, this had no inconsiderable effect in determining the result of the case.

On the 1st day of the Disease	2 were admitted.
2d . . .	3
3d . . .	7
4th . . .	25
5th . . .	21
6th . . .	34
7th . . .	14

8th	13
9th	15
10th	6
11th	7
12th	5
13th	3
14th	7
Beyond 2d week,	11

Of the whole number of cases, only 21 admitted their previous habits to be irregular, evidently a much smaller proportion than ought really to have appeared, considering the dissipated habits of that class, which are generally the inmates of the hospital. Even of this number, however, in almost one half the disease will be found to have proved fatal, which amply proves the effect which this circumstance has in determining the issue of the disease.

Regarding the period of life when fever most frequently prevails, no general conclusions can be drawn from the small number of cases which form the subject of this report. Of these,

Between the ages of 1 and 10 there were admitted	19
10 to 20	41
20 to 30	47
30 to 40	29
40 to 50	19
50 to 60	13
60 to 70	7

It will afterwards appear what an immense difference in the ratio of mortality exists at these different periods, and the great advantage youth possesses over advanced age in this particular disease.

In 39 only of the whole number of cases, could the fever be said to be uncomplicated or simple; in other words, that it was characterized in these by slight dynamic derangement of all the organs, no local symptoms predominating over the others, or demanding special attention or treatment. In the other cases the local affections bore the following relation to one another:

69 of the Head
20 of the Chest
18 of the Head and Chest
12 of the Head and Abdomen
11 of the Abdomen
4 of the Chest and Abdomen.

An important observation is the great proportion of affections of the head over the other complications, which, as will afterwards be seen, appeared to be the cause of death in more than $\frac{4}{5}$ths of the fatal cases. Another fact meriting attention, is the small number of abdominal affections which occurred, considering, 1*st*, the number of cases admitted during the summer and autumn; 2*d*, that a considerable proportion were children; and 3*d*, that the treatment pursued in all was for the most part antiphlogistic, including the employment of a considerable quantity of brisk laxative medicine, by which the symptoms of abdominal affection were relieved, and not increased, as the pathology of fever taught by several French physicians would lead us to expect.

Fatal cases.—On surveying this class of cases, the circumstance which strikes us most forcibly, and which is most fully borne out by them, is the increasing danger to which advancing years subject those affected with fever. Of the 24,

Between 50 and 60 there were	10
40 and 50	5
30 and 40	5
20 and 30	2
10 and 20	2
Below 10	0

From this may be deduced the following table, being the average mortality for each period of 10 years:

Below 20, deaths are	1 in 30
Between 20 and 30,	1 in 24
30 and 40,	1 in 6
40 and 50,	1 in 4
Above 50,	1 in 2

Of the 21 who admitted that their previous habits were irregular, more than a-half are among the fatal cases, exclusive of four, who, from being insensible on admission, could give no account of themselves. Of the 24, only 2 posteriorly stated that they were regular in their mode of life.

The day of the disease on which these cases were admitted was as follows:

4 on the 4th
4 on the 5th
4 on the 6th
2 on the 7th
1 on the 13th
1 on the 14th
1 on the 15th
1 on the 17th
1 on the 19th.

Of the remaining 5, 1 was admitted on the 6th day of relapse, and the 4 from whom the previous duration of the disease could not be ascertained; but it was evident in all, from their state, as well as the rapidity with which the fatal event followed, that the disease must have been in a very advanced stage.

The period during which several were under treatment in the hospital, almost precluded the hope of its being followed by any advantage:

3 were fatal on the	2d day	1 was fatal on the	7th day
3	3d	2 were	8th
2	4th	2	10th
3	5th	1 was	12th
6	6th	1	22d.

A singular and important fact is, that the local complication in the whole 18 who died previous to the 8th day, was seated in the brain or its membranes; and in these alone, were cerebral symptoms the cause of death. The remaining 4 consisted of 1 thoracic, 2 abdominal, and 1 affection of the throat.

The day of the disease on which the fatal event took place, as bearing on the doctrine of critical days, is important. In the cases now referred to, the days of fatal termination were;—

2	on the 9th of the disease	1	on the 15th of the disease
1	10th	1	16th
4	11th	1	17th
3	12th	2	20th
1	13th	1	23d
1	14th	1	26th

Exclusive of the 4 comatose on admission.

General Statement.—The whole number of patients admitted into the Royal Infirmary for the 12 months included in the preceding report, was 3615. Of these, 251 proved fatal, giving the general average of mortality as 1 to 14. The number of fever cases admitted during that period is 825, of whom 472 were females, and 353 males, being considerably in favour of the greater prevalence of fever among women than men. But though more prevalent, it is generally believed to be less fatal among the former than the latter; and this also is borne out by the fact, that in females the mortality was only 1 in 12, while among the men it was 1 in 7⅕; the average on both being 1 in 9½.

The season at which it was most prevalent, and that at which it was most fatal, together with the proportion of males and females admitted at different periods, will be best seen from the following table.

October,	Males,	20	43	Died,	0	6
	Females,	23			6	
November,	Males,	43	103	Died,	6	9
	Females,	60			3	
December,	Males,	34	96	Died,	4	6
	Females,	62			2	
January,	Males,	50	98	Died,	10	15
	Females,	48			5	
February,	Males,	22	62	Died,	4	7
	Females,	40			3	
March,	Males,	41	93	Died,	6	11
	Females,	52			5	
April,	Males,	21	53	Died,	2	4
	Females,	32			2	

May, .	Males,	23	64	Died	3	3
	Females,	41			0	
June, .	Males,	30	66	Died,	4	9
	Females,	36			5	
July, .	Males,	28	60	Died,	5	7
	Females,	32			2	
August, .	Males,	28	52	Died,	2	3
	Females,	24			1	
September,	Males,	13	35	Died,	2	3
	Females,	22			1	

I cannot conclude this first part of my Report, without expressing my obligations to my clerk, Dr William Home, to whose diligence and accuracy, animated by unremitting zeal, I am indebted, not only for the care with which the books were kept, and the different directions were carried into effect, but also for the readiness with which he entered into all my views, and for the patient and accurate manner in which he has digested the cases into tables, and calculated the general results.

ART. II.—*Illustration of the account of the changes which take place in the Germinal Vesicle of the Mammalia and Birds, by Dr Valentin.* Translated from the German by MARTIN BARRY, M. D., F. R. S. E.

The description of the progressive changes which take place in the germinal vesicle by Dr Valentin, in last number, it was the intention of Dr Barry to have illustrated by means of delineations drawn by the author. The letter containing the figures, however, did not reach Edinburgh till some days after the publication of the number (16th March.) There was consequently no alternative but to publish them with the explanatory references at the earliest possible period afterwards; and they are therefore given in this place, in which it is hoped the readers of this journal will find no difficulty in studying along with the researches of Dr Valentin, as given in last number, the objects now represented.

Explanation of Plate I. containing figures* 1—11, illustrating Dr Valentin's paper on the Development of the Human Ovum.

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* The drawings from which these are taken were communicated to Dr Barry in a letter from Dr Valentin, and had been derived in part from the drawings of the latter in the Dissertation by Bernhardt referred to in the memoir, (contained in the last number of the Journal) in part from Valentin's unpublished drawings. It will be seen that the germinal spot discovered in the germinal vesicle by Professor Wagner, is acknowledged and pointed out by Valentin. The latter in his letter says, that although he does not agree with Wagner in regarding the germinal spot as the origin of the germinal membrane and of the germ, yet, in a series of researches,

Fig. 1. Ovum of man, as presented in an entirely recent and unchanged condition.

a. Remains of the content of the Graafian vesicle.
b. Zona pellucida.
c. Membrane of the yolk.
d. Yolk.
e. Outer membrane of the germinal vesicle.
f. Pellucid lymph of do.
g. Germinal spot.

In order to observe this true appearance of the human ovum, the subject must be examined in cold winter weather, 20–24 hours after death.

Fig. 2, 3, 4. Different forms under which the macerated ovum of man presents itself, in subjects that have lain for several days.

Fig. 2. *a*. The content of the Graafian vesicle.
b. Zona pellucida.
c. The membrane of the yolk swollen through imbibition of water, to an almost incredible size.
c'. The greatest thickness of the same.
d. The yolk already become cloudy, and no longer presenting a trace of the germinal vesicle or germinal spot.

Fig. 3. *a*. Content of the Graafian vesicle.
b. The zone, become broader through diminution of the yolk.
c. The somewhat swollen membrane of the yolk.
d. The cloudy and altered yolk.

Fig. 4. *a*. The content of the Graafian vesicle. The zone has entirely disappeared; on the other hand, the granules of the Graafian vesicle, which lie immediately under it, appear through the considerably swollen membrane of the yolk (*c*) with their darker more minute particles.
d. The altered yolk.

Fig. 5. The entire Graafian vesicle of the rabbit, with its content, and the yolk, germinal vesicle, and germinal spot, (fig. xvii of Bernhardt improved.)
a. Membrane of the Graafian vesicle.

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[*] lately made, he has seen the germinal spot, not only as Wagner had done, in Mammalia, Amphibia, Fishes, and in the most of the higher Avertebrata, but also in Man, in Birds, and Infusoria. He adds, that Wagner also has very lately seen it in Birds and in the Actinia. There is no doubt, therefore, that the germinal spot is a phenomenon in the animal world, not less universal than the germinal vesicle. It is sometimes throughout simple, (man); sometimes composed of two particles placed together, (many birds); sometimes there are several, which have coalesced; sometimes several that are scattered, of which, however, one always distinguishes itself by its greater size. These structures always lie close upon the inner surface of the membrane of the germinal vesicle, and are to be perceived in the most recently formed germinal vesicles.

b. The larger oil-globules in its content, which are surrounded by smaller globules.
c. The content itself.
d. Zona pellucida.
e. The yolk.
f. The germinal vesicle,
g. The germinal spot.

Fig. 6. The ovum of the rabbit, particularly.
a. The oil-globules of the content of the Graafian vesicle.
b. The granules surrounding these globules.
c. Zona pellucida.
d. Yolk.
e. Germinal vesicle.
f. Germinal spot.

Fig. 7. Germinal vesicle of the sparrow.
a. Membrane of the germinal vesicle.
b. Fluid lymph contained in do.
c. Germinal spot, consisting of several coalesced globules.

Fig. 8. Germinal vesicle of the Blatta Orientalis.
a. Membrane.
b. Lymphy content of the same.
c. The germinal spot, here consisting of several scattered reddish particles, of which one is considerably larger than the rest.

Fig. 9. Germinal vesicle of the Amphibia. (Coluber Natrix.)

Fig. 10. Germinal vesicle of Fishes. (Cyprinus Brama.)
a. Membrane of the germinal vesicle.
b. Lymph of the same.
c. The germinal spot, consisting of several scattered globules. The globules are almost pellucid and diaphanous, yet consisting of an oil-like matter.

Fig. 11. Ovum of Rotifer vulgaris.
a. Membrane of the yolk.
b. Yolk.
c. Germinal membrane.
d. Germinal spot.

ART. III.—*On the History and Causes of Bronchocele or Goitre.*

By JAMES REID, M. D., Member of the Royal College of Surgeons of London; Surgeon to the Parochial Infirmary of St Giles and St George, Bloomsbury.

As far as we can ascertain, Bronchocele has been a prevalent complaint in all ages, and there are few countries in which it is not to be found, even in the present day. It is the *χοιραδες* of the Greeks; the name of *γογγρωνη* was likewise applied to it by

Hippocrates, owing to the resemblance which the tumour on the outer part of the neck bears to those which are occasionally found on the trunks of trees. From the exposed situation it occupies on the neck, which amongst the ancients was generally left uncovered by both sexes, it had at a very early period attracted the attention of the older physicians. Celsus alludes to it in the following terms: "At in cervice inter et asperam arteriam tumor increscit (Βρογχοκηλην Græci vocant) quo, modo caro hebes, modo humor aliquis, melli aquæve similis includitur."[*] Pliny, in his description of the disease, mentions that the females in the north of Italy were much affected by it, and that they wore amber necklaces as charms against its influence. Albucasis, and many others of the ancient authors, describe this tumour very fully.

Much has been written and said against the propriety of the term *Bronchocele* as applied to this affection: *Tracheocele* seems a more appropriate denomination, and is employed by Heister, Benjamin Bell, and some others. Alibert gives to it the name *Thyrophraxia*. It is the *Goitre* of the French and Swiss. The *Kropf* of the Germans; and is called the *Gozzó* in Italy.

Bronchocele may be defined as a chronic enlargement of the whole or part of the thyroid gland, attended in most cases by infiltration of the cellular tissue surrounding it; this may perhaps be regarded as true Bronchocele. There is another form, however, and that too, a frequent one, in which the cellular tissue adjoining this gland is principally the seat of the complaint, and it is this species which is most often met with, I think, in large cities, and other parts where it is not endemic, but results from accidental circumstances, and is seldom to be observed except in females.

The most simple division of this disease is that of *Thyrodeal* or endemic, and *Cellular* or accidental; the former generally developing itself under the influence of atmospheric or other causes; the latter resulting from strong corporeal efforts, such as laborious accouchements, great exertions of the voice, &c. All the various chronic enlargements of the thyroid gland and its enveloping tissue may be comprehended under the generic term of *Bronchocele*, whether consisting of simple hypertrophy, or in addition to this, of an osseous, melicerous, or scirrhous state of part of its substance; for though this combination may materially reduce our chances of success in the treatment of the disease, still a more minute division would not benefit us in a practical point of view, as it rarely occurs that we can accurately discover the *precise* nature of the tumour during the lifetime of the patient.

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[*] De Medic. Lib. vii. c. 13.

It is quite apparent, in perusing the older medical authors, that by many of them, *all* tumours appearing on the neck were included under this definition, as we find scrofulous, encysted, and even aneurismatic swellings evidently described by this name. *Struma* has been another term extensively used by them to designate the same class of tumours.

Goitre in its most common or endemic form, makes its appearance in the shape of a small tumour, either round or oblong, occupying the middle and inferior part of the neck, without any previous constitutional derangement or unpleasant feelings in the part affected; indeed, it is usually discovered accidentally by the patients or their friends. It occupies the fore part of the *trachea*, and its edges are sometimes easily distinguished by the touch or sight; at others it is so confounded with the neighbouring parts that it presents only the appearance of a fullness of the neck. The tumour, if at all moveable, is so at its sides alone; it follows all the movements of the *larynx* to which it adheres, ascends and descends with this organ in inspiration, expiration, and deglutition. It gradually becomes larger, lobulated, and extends on either side outwards and upwards; or occasionally one side first increases in size, giving a feeling of elasticity to the touch, and in a short time afterwards the others. The right lobe I have generally observed as that which first became affected, but even when both are simultaneously enlarged, one may increase much more rapidly than the other.

Occasionally one side alone is affected, the other remaining always in its natural state; and again, the latter may, after remaining stationary for many years, suddenly and rapidly increase, and perhaps in the course of a month, acquire a much larger volume than the former. The central part of the gland or *isthmus*, is generally included in this enlargement, as far as my own observation is concerned, though in some cases a tumour of a pyramidal form is to be seen on each side of the *trachea*, lying nearly parallel to the sterno-cleido-mastoid muscles, which latter, in an advanced stage of the disease, either overlap their external lateral surfaces, or are pushed aside as the gland rapidly extends in that direction.

Deformity, and uneasy sensations about the neck are frequently the only inconveniences accompanying the growth of this tumour; and it is to remedy these that the patients in most cases apply for medical assistance, as they seldom apprehend any danger from the disease. The tumour is not painful to the touch unless when inflamed, which is not often the case. Sometimes, however, it puts on a darkish-red hue, the veins on its surface become tortuous and varicose, and the least pressure on the part produces a sensation of suffocation.

The *symptoms* generally attending *bronchocele*, when it has attained any size, are, uneasy sensations in respiration, especially after increased exertion; and constant weight is felt about the throat, progressively increased, as if some substance were lodged there which could not be swallowed. There are slight shooting pains from the throat to the head and ears, extending in females down to the *mammæ*, accompanied frequently by palpitations of the heart, whilst giddiness, and momentary sensations of suffocation gradually supervene. I have observed that the tumour in many cases becomes larger in the evening, and that any agitation of mind may produce the same temporary effect. As it enlarges in size, dreadful headachs and giddiness attack the patient, difficulty in swallowing and breathing increase, especially after any exertion, such as ascending a flight of stairs, and even render the recumbent position almost insupportable. We now observe bleeding from the nose, ringing in the ears, attended with pain about the lower and lateral parts of the neck in the situation of the great plexus of nerves, extending down one or both arms and breasts, and not unfrequently, in this advanced stage of the disease, there is a sensation of suffocation lasting for some minutes, and threatening to destroy the patient. These gradually come on at shorter intervals, and at length in one of the paroxysms put a period to the life of the patient, after a struggle of uncertain duration.

The size of the tumour is influenced by the temperament of the individual attacked by it; it is generally less in healthy vigorous constitutions than in the leucophlegmatic, and those of lax fibre, and it is in the latter that we find the cellular tissue most affected. Its augmentation varies in rapidity in like manner. When the tumour becomes very large, and especially when it is hard or scirrhous, pressing on the larynx, carotids and jugular veins, the voice is altered, having a peculiar hoarseness, the respiration is very much impeded, and, as I have before remarked, suffocation or an apoplectic seizure carries off the patient. Occasionally the tumour not only presents an obstacle to deglutition and respiration, but occasions severe pain and a suffocating cough whenever the patient attempts to swallow any solid or stimulating food. The function of hearing is likewise much impaired when the tumour presses on the parts adjacent to the auditory apparatus. Œdema, a purple hue of the face, and epistaxis, are found now gradually to increase, and depend on the same cause, viz. the pressure on the great veins which return the blood from the head.

To produce all these distressing symptoms, it is not requisite that the goitre should be of large size; a variety of this disease, named by an old French author the *Goitre en dedans*, which projects but little externally, will produce equally severe symptoms, as it extends backwards, gradually encircling the *trachea* and *œsophagus* until at length its *cornua* meet. This form of the complaint, though not presenting the same visible extensive appearances of danger, is to be regarded even with greater apprehension than the others, as respiraton, deglutition, and the voice, are affected to a greater extent. In those fatal cases of bronchocele which I have had an opportunity of observing, I have found that the *trachea* and *œsophagus* were either completely or nearly encircled by the *cornua*; and I believe that few cases terminate the patients' life without this being the case. Mr A. Burns, in his work on the Surgical Anatomy of the Head and Neck, has noticed the aggravated symptoms produced by a comparatively small tumour of this description, but attributes them (erroneously I think) to the different state of the muscles on its anterior surface, the respiration being more or less affected, he imagined, in proportion as they resist or give way to its increase. In the cast of a tumour of this description which I forwarded to the Hunterian Museum in London, the dimensions do not exceed that of a moderately sized apple, though it occasioned the death of the patient.

Bronchocele sometimes, however, on the contrary, gradually increases to an almost incredible magnitude, when it lies *merely* in front of the *trachea*, without being attended by serious symptoms. In those countries where the disease is endemic, the tumor sometimes acquires a prodigious bulk, its weight amounting even to 9 or 10 lbs. Even in England it may be occasionally observed presenting dimensions somewhat approaching those of the head. Mittlemeyer represents in a plate one which he saw reaching down to the knees, and relates other cases, in which it hung as low down as the umbilicus. Gautieri, too, describes some cases in which the tumour reached to the pubes; whilst in parts of South America, it is related by Bonpland that goitre attains such a size frequently, that those affected by it are obliged to support the tumour by means of a suspensory bandage. Alibert informs us, in his Nosologie Naturelle, that he once saw a goitre in a Tyrolese shepherdess formed like a long cylinder which reached to the middle of the thigh, the diameter decreasing towards the lower part.

Although the gland and surrounding tissue may have acquired this immense volume, it seldom happens that the skin which covers it, ulcerates, or even changes its appearance to any extent, except that the veins become varicose and much enlarged. Foderé asserts that the tumour is subject to periodical enlargement and diminution which depends on the dryness or humidity of the season: the fact itself I have at different times verified, though I will not venture to affirm that it depended on the precise cause he mentions. It is certain that the structure of bronchocele varies much as to the consistence of its substance being occasionally much softer to the touch than usual. Some authors who noticed this fact, have attributed it to the influence of the moon; but it may with much more reason be ascribed to uterine influence, as the circumstance occurs in females only. The great sympathy which exists between this part and the functional action of the womb, I have frequently had occasion to observe, the tumour increasing much in size from difficult or suppressed catamenial discharge, and subsiding in a marked manner on the re-establishment of regularity in this respect. Verduin narrates a case somewhat singular as connected with this subject. "A woman affected by Bronchocele, from which she had much suffered, (numerous remedies having been tried without any benefit) had a small opening made on the surface of the tumour from which a thin yellow fluid exuded, but no diminution as to size followed; at each succeeding menstrual period, however, curious to relate, says he, the usual discharge took place not naturally, *per vaginam*, as heretofore, but vicariously from the opening in the neck."

Dr Jordan of Göttingen alluding to the influence of lunar changes on this description of tumor says, "Equidem ipse duos vidi infantes, puerum quinque et puellam novem annorum; ambo ab infantia jam glandulæ thyroideæ tumore laborabant, eorumque mater sanctissime mihi affirmabat, se, talem mutationem, lunæ mutationibus arctissime respondentem, et in infantibus, et in semet ipsâ strumam gerente, observasse."

A certain degree of fulness in the neck at its lower part is frequently observable in young females. One young lady, whom I have occasionally had under my care for other complaints, has this fulness to a remarkable degree; it existed from her birth, but she has never experienced the slightest inconvenience from it. The thyroid gland does not seem to share in the tumefaction but merely the cellular tissue surrounding it.

Any disturbance of the uterine system tends to produce an augmentation of this part; and the neck is generally found to be slightly enlarged in girls on their arrival at puberty. A certain fulness of the neck was described by the ancients as naturally occurring in young females the day after marriage; and there was then (as there still is I have heard in some districts of Germany) a custom of measuring the young bride's neck on that day in order to ascertain "an integra vel corrupta esset!" It is to this circumstance that Catullus alludes in his Epithalamium:—

"Non illam nutrix orienti luce revisens
Hesterno poterit collum circumdare filo."*

and the explanation is given by Palladius Fuscus. "Veteres, quoties scire volebant, utrum puella virgo esset necne, ei filum ab angulo oris per verticem ad alterum angulum deducebant; postea idem filum complicatum collo ejusdem puellæ circumdabant; ergo si nutrix non poterit collum Thetidis hesterno filo circumdare, id procul dubio indicabit Thetidem a viro suo compressam amisisse virginitatem."

Again.—

—"Sed postquam Donacem duri clausere parentes
Quod non tam tenui filo de voce sonaret,
Sollicitusque foret linguæ sonus, *improba cervix*
Suffususque rubor crebro, venæque tumentes."

CALPURNIUS.

Although this test or ordeal would not be readily submitted to as a just one by the *puellæ* of the present day, it is not perhaps so improbable that this fulness of the neck might be found to exist shortly after impregnation.

The age of puberty is the period when goitre generally makes its appearance in those countries where it is endemic.

Bronchocele is endemic in almost all mountainous countries, and is occasionally found in those likewise where no elevated ground meets the eye for miles. Temperature alone seems to produce no difference, as the disease is found equally common in the sultry regions of Java, Sumatra, Tartary, and Hindostan, and in the frozen tracts within a few degrees of the pole. Few countries indeed are exempt from it. In Europe the mountainous tracts of Switzerland, the Tyrol, Silesia, Carinthia, and Styria, are peculiarly subject to it. In our own island, Derbyshire has affixed its name to this tumour, known by the appellation of the Derbyshire neck; but it is likewise very common in Buckinghamshire and some other counties, especially in the hilly parts of them. Even in London and its vicinity it is not uncommon, much less so, indeed, than I had supposed before my attention was drawn to this subject. Amongst the Apennines and Pyrenees this disease is very prevalent. Dr Barton of Pennsylvania informs us, that it is not uncommon in most parts of the United States, although he remarks that he has never seen one male affected by it. The natives of the Isthmus of Darien occasionally have it to a very great extent, and it is frequent amongst the Mohawks and other Indian tribes, according to Bonpland. In the small towns of Hunda and Monpar in New Granada on the Magdalena river, almost all the inhabitants are subject to it. The blacks and persons of very active temperament are alone exempt from its influence, the women shewing its effects much more than the males. In some parts of France, Italy, Russia, &c. it is a very prevalent affection. M. Biett states, that at St Jean de Maurienne, which is situated in a deep gorge of the mountains, 80 per cent of its inhabitants are goitrous, and of *eight* women whom by chance he saw at a well, *seven* had tumors of this description.

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* Nuptiæ Pelei et Thetidos.

In Hindoostan, Goitre, or Ghéga as it is there called, is in many parts the most frequent disease that exists. In a very interesting paper by Mr M. J. Bramley in the Calcutta Transactions, we are informed that in the valley of Nipâl, which is the largest and most populous one in the country, (its diameter being either way about 16 miles) men women and children of all ages are subject to it. There are 41,798 houses in this district, and the lowest ratio of goitrous cases even in the largest towns, is about 3 or 4 per cent. In some of the minor towns and villages it is 11 per cent, and in a few of them rises even to 40. In a small village named Carphu, situated on the crest of a high mountain, Mr B. counted 48 individuals who had this complaint out of a total of 53. The valley of Nipâl itself lies 4500 feet above the level of the sea, is very fertile, and highly cultivated for rice. Mr Evans likewise mentions, in the Medical Transactions of Calcutta, vol. iv. a place called Maha-Deo, about fifty miles from the foot of the hills, where 103 out of the 236 inhabitants were affected by bronchocele, fourteen of whom were children under ten years of age.

Some of the older authors describe the disease as very prevalent in various parts of the East. Yarkund is mentioned particularly by Marco Paolo as a place in which it existed to a great degree. Switzerland is perhaps in Europe one district in which goitre is most prevalent, and according to Juvenal was as subject to it in his time as at the present day.

> "Quis tumidum Guttur miratur in alpibus."
> 13th Satire.

The Valais is the part of it in which it is most common; and in a village near Sion almost every inhabitant is affected by it.* In Transylvania it is so frequent, that three out of five persons are sometimes to be found in one house with it, whilst amongst the mountainous recesses of the Balkan it does not exist at all.† I have never met with the complaint in the hilly tracts of Scotland, though it is said that in a small sheltered village in the Isle of Arran, it, as well as Cretinism, is to be found. In Wales it is not unfrequently seen. In general then, it seems that goitre is most frequent in mountainous districts, though occasionally it is very prevalent on the plains. Thus in those of Siberia, according to Gmelin, especially in the environs of Kirenskoi, which are very fertile though in 57° 48′, the inhabitants, and even animals, are very liable to this affection, though no mountains are visible from the place. Again, in Lower Canada, where plains continue for miles occasionally, without a single elevation, districts are observed in which the disease is frequent. The native French peasants it is said are much more liable to it than the British settlers, the latter being seldom attacked, though snow and river water are drunk by both at all times.

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* Coxe's Travels.

† Walsh's Constantinople.

It is a curious circumstance connected with this disease, that the tumour should in some places be regarded as an object of beauty instead of being considered a deformity. In those parts of the alpine districts where I have had an opportunity of observing it, the individuals so affected were all anxious to be relieved of the appendage; but we are informed by some authors that, in certain places, instead of this being the case, it forms quite a requisite in the scale of personal attractions. A poet of the Valais is said to have presented his mistress with a *sonnet on her goitre*, and Girard in his " Traité des Loupes," relates that in some parts of the Tyrol it passes for an ornament, and that they who have it not are ridiculed by the appellation of *Cols de Grue* or *Crane-necks*. The following anecdote then follows. " Un Anglois voyageant dans ces contrèes attira tous les regards par sa figure, mais on trouvoit qu'il lui manquoit un grand agrêment: *Le bel homme*, disoit on, *s'il avoit un Goitre.*" Alibert tells us (speaking of the females affected by it in some parts) that, " quelques voyageurs nous attestent que leurs amans ont un gôut si decidé pour cette tumeur extraordinaire qu'a leur jugement, ce genre de beauté egale au moins celui de la gorge." *De gustibus non disputandum est.* Again, in the district of Bünsgens in the Tyrol, the size of this tumour is sometimes remarkable, and we are informed that should a child be brought forth unfortunately without some indications of this pretension to beauty, fervent prayers are offered up for its appearance. It is curious to observe, on the contrary, that amongst the uncivilized tribes, such as the Mohawks, &c. the tumour is always concealed as much as possible, being regarded as a deformity.

Bronchocele is found in all countries to affect females in a much greater ratio than the males; and adults and children, rather than elderly persons. Dr Manson of Nottingham, gives the number of his female patients in comparison with the male as 105 to 15. The proportion is still greater in London, according to my own observation. Holbrook, on the contrary, gives the proportion in his cases as 33 to 32 only, but observes, that in the males it was generally of a very trivial size. In the

Hampshire county hospital 49 patients were admitted with this complaint, one only of whom was a male. In the Chichester Hospital, out of 70 patients, 2 only were males, and these both boys of feeble and lax constitution.* Mr Bramley gives the ratio in his cases in India as 140 females to 124 males; of the former 15 were girls under ten years of age, and 3 of these latter again under the age of four. Of the males, 15 were boys under ten, out of whom 6 had not attained the age of six.

It has been a question frequently considered by authors, whether this disease is hereditary or not; and the opinions of most of them have inclined against the fact, their principal reason for this determination being, that they had never seen an infant affected by the complaint. This, if true, even, would not be an unanswerable objection; but several authors even in the last century have affirmed that they have seen children at the breast affected by bronchocele, and not unfrequently have observed it even at birth. Having doubted the fact myself for some time, I am the more ready to acknowledge its existence at present. Within the course of two years I have had the opportunities of seeing three infants who had this tumour fully developed, and in one of them who died a few months afterwards from some other complaint, I was enabled to examine the part, and found the thyroid gland much enlarged. Foderé thinks that he observed the tumour in three cases of newly born children, but says that he may have been mistaken. Callisen, Sharp, and some others, speak as to having seen this tumour in children at a very early age. Dr A. Crawford mentions, in the Practical Cyclopedia of Medicine, the case of a woman whose grandmother, father, paternal aunt, and cousins, likewise had this complaint, though they had not resided in the same place, and no other persons in their different neighbourhoods were affected by it.

Mr Bramley affirms, that in India both children and animals are born with it, and that he saw several children in arms, in the village of Carphu, who had this swelling. In Nipâl he says, a goat brought forth a kid with a goitre equal in size to its head. Puppies and lambs are there frequently to be seen with it. Mr Fraser informs us, in his tour through the Himala mountains, that he observed several infants of very tender age who had this tumour. Amongst others of a more advanced age, a young prince about six or seven years old had a large one, and his father was afflicted by the same complaint. The swellings in some of the cases were of immense sise, uncouth, and shocking to the sight. Gohlius gives a description of a congenital bronchocele of large extent, reaching from the ear to the chest; it had evidently a communication with the trachea, as crying enlarged and filled it, but when the child was quiet, the tumour again subsided.

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* Cyclop. of Pract. Med.

Like all other hereditary complaints, instances are met with in which some of the children of a goitrous parent inherit this disease, whilst the others do not. Thus much is certain, I believe, that the progeny of those affected by goitre, on being exposed to the same local exciting causes, are more susceptible of taking it, than the children of those who have it not. Saussure says that those children who reside in countries obnoxious to this complaint, and who escape its attack till their eighth or tenth year, are safe for life from it.

Most animals are subject to bronchocele, in countries where it is endemic. Buffaloes, goats, sheep, and dogs, are affected by it in India, according to Mr Bramley, and Alibert says that sheep and calves not unfrequently die of its effects. At Purneah near Nipâl, where the 1st Regiment of Cavalry were stationed in 1824, I am informed that many of their camels were sent away, having contracted this complaint. Crows have been observed affected by it likewise at the same place.

Bronchocele, generally, is of a very indolent character, progressing slowly in its growth. The lymphatic temperament is favourable to its developement in either sex. Individuals residing in the country are more subject to it than those inhabiting towns, and the higher and middle classes are on the whole not so easily affected, though not exempt from its attacks. It it most prevalent as an endemic in deep and humid valleys; indeed it has always been a general idea with authors on this subject, that bronchocele is confined to these situations, and never observed on the sides or summits of mountains. It was even asserted by them, that in no place had it been found to exist, even above a certain number of feet above the level of the sea. This idea is now, however, completely refuted. Goitre has been seen in individuals residing 7000 feet above the level of the sea in the Himala mountains, and according to the description of the natives, it exists on their highest habitable points, which are 15000 feet high, or about 11,000 feet from their summits. Humboldt remarked this disease on the high plains of Santa Fe de Bogota, which lies 6000 feet above the bed of the Rio Magdalena, although in the intermediate space it is not seen. It is said to be progressively increasing in frequency in the higher parts of the Cordilleras.

Cretinism is a subject far to extensive to enter fully upon here, though from its connection with goitre it cannot be passed over altogether in silence. Most authors assert that their is no necessary connection between the two; but still little doubt can exist, I think, that the same cause which produces the one, may, when prevailing to a greater extent, generate the other. Cretins, I believe, are never found in countries where goitre does not likewise exist; indeed the majority of these unhappy beings are deformed still more by the tumour, but goitre is prevalent to a great extent in some places where Cretins are unknown: this is the case in Nipâl, and it has been remarked, that those who are affected by goitre in those parts, have their intellects not in the least affected or impaired. Mr Marshall, in the Edinburgh Med. and Surg. Journal, has observed, that two-thirds of the inmates of the Lunatic Asylum at Milan, had goitrous tumours. Cretins are almost always found in the valleys alone where goitre is seen in its worst form, and where the air is hot and moist, and vegetation abundant. They, like many suffering from goitre, may be very much improved by removal to a higher situation; and both these forms of disease may be occasionally avoided in infants, by causing them to be carried to another district at an early age.

De Saussure * has given one of the best descriptions of Cretinism which we possess. The works of Foderé † and Gautiéri ‡ on this subject, are likewise valuable.

VARIOUS CAUSES WHICH MAY PRODUCE BRONCHOCELE.

I have before drawn the distinction between two forms of this disease, viz. *Cellular* or *Accidental*, and *Thyroideal* or *Endemic*. I will now proceed to enumerate the different circumstances which may influence the formation of the former, premising, however, that the existence of those which absolutely cause the one, may likewise have a material effect upon the other; for patients in the latter case are predisposed the more readily to suffer from the active agency of the proximate cause, when local influence exists.

A. Accidental Bronchocele, or that in which the cellular tissue shares principally in the enlargement, is the form met with most commonly, I think, in this country. It is found to exist generally in females of a leucophlegmatic temperament and lax fibre, and more frequently in those of mature age, than in young subjects. On inquiring into the history of the tumour, it is traced in general to some sudden or violent exertion, in which the throat has shared, such as violent straining, vomiting, coughing, great exertions of the voice, carrying heavy weights upon the head, hysterical paroxysms, &c. The latter may, however, be classed among another description of causes, whose influence in affections of the throat is of much importance, viz. "disorders of the uterine system."

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* Voyage dans les Alpes.

† Traité du Goitre et du Cretinisme.

‡ De Tyrolensium struma, 1794.

1. This form of the disease has been observed in all countries from the earliest times, and is generally described by modern authors also. The most common cause of it is, I think, laborious parturition. In a great proportion of the cases which have come under my care in London, I have been able to distinctly trace their origin to the violent exertions of the patients at this time. It is a very frequent custom with parturient females to smother their cries, according to the phraseology of the nurses; and the effect of thus forcibly holding their breath, during the strong efforts made to expel the child, must produce an intense pressure upon the more lax and pliant tissues of the throat It may thus produce bronchocele, either by rupturing the lining membrane of the larynx, and forcing the air into the cellular tissue of the gland, or, by producing congestion at this part, the afflux of blood gradually dilating the vessels, they may even become varicose. Wicheman, Gautieri, and others, indeed, consider that bronchocele altogether depends upon an aneurismal and varicose state of the vessels on the anterior part of the neck and thyroid gland. So well aware are practitioners in Austria, and some other parts, of the effect of parturition, in producing goitre, that they are sometimes accustomed to place bandages round the patient's neck on these occasions, in order to prevent it; at the same time it must be confessed, incurring the hazard of producing apoplexy by the precaution. Haller remarks, "frequenter tumores aereos in glandula thyroidea a nixu parturientium oriri, qui telam cellulosam distendant, manifesto argumento, vias esse ex arteria aspera per quas aër in glandulam thyroideam exeat."*

Lalouette opened a bronchocele in a female, from which nothing but air escaped, and the tumour then subsided. Although air, however, may be thus the first cause of distension, still lymph may afterwards gradually supply its place, and be continually regenerated by the morbid action of the lymphatics, for the whole structure of the tumour seems at length to share in a general relaxation of its tissues, arteries, veins, lymphatics, &c. The same author says, that he has seen these aerial tumours attend the throes of labour, and, like Haller, quotes the fact as proving a direct communication between the trachea and the gland. Portal alludes to the increased size of the throat in females who have borne several children, especially if they have had laborious accouchements. A. Burns likewise has remarked the frequency of bronchocele after labour, but attributes it to chronic inflammation, and says that the tumour has been known to suppurate. This, however, is an exceedingly rare circumstance, and the appearance of the tumour is too soon apparent after the labour itself to be attributed to the cause he mentions. Petit indeed relates, that his own wife's goitre was cured by a fortuitous suppuration; in this case likewise the tumour had appeared after her accouchement, but some years before the cure took place. Many cases that I have seen had occurred soon after parturition,—but there was seldom any pain felt in the tumour, which might indicate the presence of any inflammatory process having subsisted. How great the force acting on the neck during the expulsive effects of labour is, owing to the violent action of the muscles, may be imagined by a case which Halix relates, in which the thyroid artery was ruptured, and a large quantity of blood lost.

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* Elem. Physiol. Tom. iii.

2. Pregnancy alone has the effect sometimes of increasing the size of the thyroid gland: in fact the whole glandular system of the female is much more developed at this epoch, than it ordinarily is. Bronchocele not unfrequently makes its first appearance in this country during this period, and Coindet mentions a case which he saw, where it occurred at this time, and disappeared twelve hours after the female was confined. Pasta attributes the fact, and perhaps not without reason, to the frequent strainings from sickness in pregnancy, and indeed he once saw it immediately follow a severe fit of vomiting. Boyer remarks, "that in women it often appears only after marriage, and during the first pregnancy or during labour."*

3. Any great exertion of the voice will occasionally cause this swelling. Wicheman had three cases in which it came on suddenly from efforts in singing, and I have known two instances of a somewhat similar nature. This species Baron Larrey considers as true bronchocele, and believes that it is caused by one or several tumours, containing air, which, forcibly compressed in the larynx or upper part of the trachea, produce small ruptures of the mucous membrane, rapidly increasing in size. He says, that in Egypt it is frequently observed amongst the blind, who are there very numerous, and are employed as muezzins to chant the hour, &c. from the tops of the minarets: two or three years in general suffice to incapacitate them for the employment, owing to the appearance and rapid enlargement of these tumours. He likewise mentions the cases of two sub-officers employed as military instructors, who became likewise subject to bronchocele

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* Clinique Chirurgicale.

owing to their constant exertions in speaking loudly.* It follows, then, that where bronchocele exists from any other cause, great exertion of the voice will in many cases evidently increase the size of the tumour.

4. Carrying heavy weights on the head may act as another exciting cause of this complaint, owing to the continued and violent action of the muscles of the neck. In Derbyshire, the women I understand are accustomed thus to carry heavy weights up and down the hills; and in India the bokears or hill-porters, are particularly liable to this complaint. As there is no other mode of conveyance for goods amongst the mountains, but by means of this class, they are in the habit of bearing sometimes nearly a cwt. on their head or shoulders, thus causing a forcible strain upon the throat.

In the foregoing cases, the whole glandular apparatus in the vicinity of the thyroid, such as the tonsils, and the glands about the glottis and trachea, sometimes enlarge simultaneously with it.

5. Irregularity of the menstrual function has a very marked effect upon this complaint. Dr W. Hunter, Petit, Burns, and many others have observed the fact; and from my own experience on the subject, I would almost venture to affirm, that in the cases of young females, where we are consulted as to this tumour, we shall, on inquiry, find that the majority of them are subject to this irregularity. This is frequently accompanied too by hysterical symptoms, and even complete paroxysms are not uncommon, by which the enlargement of the gland would be more likely to increase. Alibert relates the case of a young girl, who, whilst crying, had a quantity of water thrown in her face; an hysterical paroxysm was produced by it, and a large goitre rapidly appeared, which resisted all remedies.

The enlargement of the neck, which is the consequence of disordered uterine function, not unfrequently disappears, on this organ regaining its healthy action. The size of the bronchocele may be much influenced by the same cause: I have met with one case in which it had remained dormant for two or three years, whilst the catamenia were regular, but the patient having taken cold, they were suppressed for a time, and the tumour immediately enlarged, and continued gradually to do so still more for a considerable period. Any sudden suppression of the customary discharges may occasion a corresponding plethora of the vessels in other parts, which, being weaker, take on an action, to which otherwise they would not have been exposed. Brambilla in his Trattato del Flemonia, p. 88. has remarked this circumstance as occurring in subjects who at other times are not at all plethoric: "A singular phenomenon arises in those temperaments, which, though in the healthy state not plethoric, become so suddenly when attacked by certain diseases."

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* Traité des Malad. Chir.

Lieutaud and others mention cases in which the stoppage of a leucorrheal discharge has produced similar effects.

6. Any strong local irritation will occasionally produce a bronchocelous tumour, by exciting the vessels of the part: a blow has been known to act as the cause. Dr Baillie has stated, that when ulceration takes place at the upper extremity of the œsophagus, the thyroid gland is frequently enlarged beyond its natural size, and rendered somewhat harder in its texture; he thinks, in these cases, that the disease partakes somewhat of a cancerous nature.

B. Endemic Goitre is for the most part found to exist in Alpine districts, but it is not confined to them. The same cause must be supposed to act upon all the individuals who are subject to this tumour, whatever its nature may be, whereas the other kind, or accidental, may occur in any place, and be produced by a variety of causes. In seeking to determine what is the precise nature of this cause, we meet with obstacles at every step, for there is not one theory which has yet been brought forward, though supported by numerous facts, but is met by a corresponding body of evidence to prove that the disease may exist, and that to a great extent, completely independent of the very cause adduced. Thus in the end we feel obliged to confess, that no one satisfactory agent can be pointed out as the sole cause of this disease; for we find it on the mountains, and in plains; in dry and humid localities; on soils containing much lime, and on those in which it does not exist; in places where nothing but snow-water is used, and in some where it was never seen. I will, however, proceed to consider them seriatim.

1. The use of snow-water, as a constant beverage, had been universally considered, till within a few years past, as the sole exciting cause of goitre, but several facts may be brought forward to refute this opinion. Thus in Switzerland, many individuals reside high up on the mountains near the Glaciers, (which are immense masses of congealed snow and ice), and drink no water but that which is supplied from them, and yet are not so subject to this disease as their neighbours in the valleys below, who find it one of their most prevalent complaints. In Greenland, where snow-water is the usual drink, goitre is unknown. At Edmonton in the Arctic regions, we are informed by Dr Richardson that the disease is common; those natives who on their journeys drink nothing but melted snow are not affected by it, and when at home during the winter, (at which time they drink river water,) incipient symptoms of this tumour are likely to

occur, but the annual journey to the sea coast soon removes them. A residence of a single year at this place is sufficient to affect a whole family. Again, at a place in those regions called Carlton House, where melted snow forms the only drink of the natives for nine months out of the year, this disease is unknown.

On the other hand at Maraguita in South America, the goitres are most hideous, and yet the inhabitants do not drink snow water, but that flowing over a granite bed. The river Arve, which runs close to Geneva, and which arises in the glaciers of Mont Blanc, is one of the purest waters possible; the waters of the lake and of the Rhone which join it, are less so, but still, more pure than that of the best springs in the neighbourhood, (as shown by chemical analysis), being in fact principally melted snow, and yet we find that those who reside on its banks and make use of it, are not so subject to bronchocele, as those who use the hard water in the town. Dr Coindet mentions as a curious fact, that many of the soldiers in Geneva who drank of the hard pump water were speedily thus affected by it, but on leaving it off the tumour disappeared in a short time. In Java and Sumatra where snow is seldom if ever seen, the disease is not uncommon. It is a curious circumstance, that on the banks of the Gundûk river in India, villages are to be seen contiguous to each other, the one, with scarcely an inhabitant exempt from the complaint, whilst in the other they are perfectly free from it. The same circumstance has been observed in Nipal.

2. Hard water containing calcareous particles in solution, has often been mentioned by authors as that cause on which bronchocele altogether depends. I have already mentioned the fact stated by Dr Coindet, and Dr Bally affirms that the use of some fountains in the department of Leman will produce goitre in eight or ten days, and that those of the inhabitants who avoid these springs, are free both from it and Cretinism.* Lambroni again has made the remark, that no goitre exists in valleys composed of granite strata, but that it is met with only where they consist of magnesia.† Dr Mombert mentions that Bronchocele is very common in Wanfried. This town is situated in a valley surrounded by calcareous mountains, and owing to this the water is hard. The condition of the poor is wretched, and their dwellings are damp and unwholesome. Strangers residing there are not liable to the disease, but their children are, in fact some are born with it. Dr Jahn, in the Journal Complementaire, says that bronchocele is never observed in places where the water springs from ground that is basaltic, porphyritic, granitic, or gravelly, whereas he constantly found it to exist in

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* Dict. de Sc. Med. tom. ix.

† Lancet, vol. vii.

places where the water issued from calcareous soils containing lime in mixture.

Even in the time of Pliny the use of certain waters was supposed to produce this disease, " Guttur homini tantum et suibus intumescit, aquarum quæ potantur plerumque vitio," he remarks; and in most places where the goitre is prevalent, whether in the tropic or arctic regions, it is attributed to this cause by the natives. Georgi, in his " Travels through Russia" in the year 1772, remarks, that in Siberia the disease is not attributed to the snow-water, " keiner aber wird damit (with bronchocele,) gebohren, sondern es findet sich nach dem Wassertrinken, welches vermüthlich sehr selenitisch ist."

So strong is the prejudice in the frontier parts of some of our possessions in India, that at Purneah, near the Nipâl hills, where the Ghéga is very common, the British residents there will not, as I have been informed by a friend, drink of the river Coosee, which runs by the place, but have their water brought from the Ganges, which is three days journey off. Here, too, is remarked a fact which is quite at variance with De Saussure's opinion, who remarks, " les etrangers qui viennent s'etablir dans le pays, (where goitre is endemic), ne le prennent jamais, mais leur enfans y sont sujets comme ceux des indigenes." Now, at Purneah and other places on the frontier, not only have whole families of children been attacked by it, but many English ladies have contracted the disease to some extent, and have been obliged to leave the place in order to prevent its further progress. The fact had been noticed by some of the older authors, amongst others by Rudolphus Camerarius, who in his Syllog. Memorab. Medicinæ, remarks, " Nec incolis id tantum illic natis vernaculum est vitium, sed etiam advenis, qui si collo anserino graciliore advenerint et aliquot annis de his fontibus potaverint, guttura eorum veluti taurorum colla quibus palearia dependant, referre videbis."

De Luc and many other authors ascribe this malady to the use of water containing lime, gypsum, &c. General Pfyffer of Lucerne asserts, that all the springs in that town, with the exception of one, contain these earths in solution, and that those of the inhabitants who make use of the latter one, are less subject to goitre than the others. Dr Manson of Nottingham attributes the disease also to the waters of the place.

I have been thus diffuse in mentioning the different authorities for this theory, as it is the one most commonly admitted, not only by the natives of places subject to the complaint, but by medical men in general. There are, however, many forcible objections to it. Bronchocele, for example, is scarcely known in many parts of our own country, as well as in others where calcareous particles exist in large quantities in the springs, whilst in other localities where they are not found at all, or exist in a very small proportion, the disease is extremely common. Thus in Nipâl a very careful analysis by Mr Prinsep, of the waters most commonly used in that valley, shows, that there is an exceedingly small quantity of saline or earthy matter in them.

On Mont Cenis and other elevated places in Switzerland, where the water runs over a surface chiefly composed of sulphate of lime, we scarcely meet with the disease, whilst in the valleys, where little of this substance is found, the complaint is very prevalent. Foderé analysed the waters commonly used in the lower part of the valley of Maurienne, where almost all the inhabitants are subject to goitre, and found them to contain less gypsum or calcareous matter than those of the higher parts, where there are no goitres. We are informed also by Sir Stamford Raffles, in his " History of Java," that in a village at the foot of the Yeng-gar mountains in the eastern part of that country, every family is affected by the malady, while in another village situated at a greater elevation, and through which the same stream descends which serves for the use of both, there exists no such deformity.

It has been supposed that calcareous deposits in the thyroid gland have been the sole cause of bronchocele, because these substances have occasionally been found in this part after death; this, however, is rarely the case.

3. The use of very cold water as a beverage has been cited by Gautieri, Forster, and other authors, as likely to produce this disease; but the same arguments which militate against the snow-water, will apply here.

4. That particular articles of food of an indigestible nature are the cause of bronchocele, is an opinion which, though entertained by Mittlemeyer and some others, is not at all tenable. In many countries where the greatest misery exists, and where the diet is of the coarsest kind, goitre is very rare, whereas in goitrous districts, those who have the command of every luxury are not exempt from it.

5. As bronchocele and intermittent fevers are frequently found to be prevalent in the same districts, marsh miasmata have been considered by some to act as the exciting cause under certain circumstances. Stagnant air and humidity certainly appear as likely as any of the before-mentioned causes, to be the means of producing the disease. This is the opinion of De Saussure and Foderé, who have written two of the best works which we possess on this subject. At Sion and some other parts of Switzerland, the number of goitrous cases, it is said, have been much diminished of late years, owing to the magistrates having caused all

the stagnant waters near the towns and villages to be drained off, and to the inhabitants now generally sending their children, during the tender and susceptible period of infancy, to be reared on the mountains above them. We must, however, still remember, that, though confined and deleterious air may be, especially when combined with humidity, an active agent in producing endemic goitre,—this disease is sometimes found in the mountains, or in open plains.

The worst form of this disease, however, is generally found in deep mountainous gorges, in which the heat of the atmosphere is most oppressive, and of that suffocating nature which we sometimes experience before a thunder storm in summer. Those who have travelled through the Valais, and some other parts of the Alps, will recall to mind the disagreeable sensations which they may have experienced in these places, and the oppressive effects which have been produced about the regions of the chest and throat. This want of circulation in the air, combined with the effects of the sun on the rivers and marshes, which generally are found in them, together with the exhalations from the rich vegetation of these spots, render them, as Foderé truly expresses it, a complete vapour-bath. Thus the Valais, which is the head quarters both of Cretins and goitrous subjects, is a tract enclosed by towering mountains, and exceedingly narrow, so much so indeed, that a single gate is sufficient to enclose the entrance to it, and it is so fertile that it requires little cultivation to yield its produce. The heat is excessive, and the reflection of the sun from the Rhone and its marshy vicinity, often render it almost insupportable. The inhabitants generally are remarkable for their apathy and languor. The valley of Maurienne is similarly situated.

In India, according to Mr Bramley, that half of north Bahan which is next to the Ganges is healthy, but the other half near the mountains is very close, owing to the great want of ventilation. Rice is there very much cultivated; there is great excess of vegetation and humidity; and during six months of the year the atmosphere is most pestilential. Sudden variations of temperature are remarkably common at this part. In Sumatra, too, where bronchocele exists, the rains sometimes continue from November to March, whilst the force of the sun occasions an amazing quantity of aqueous vapour to hang over the lower parts of the island, and though Fahrenheit's thermometer seldom rose in the shade above 86°, yet the air felt as if coming out of an oven; it produced inertness and debility even in the most healthy. *

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* Sir G. Staunton's Account of the Embassy to China.

Mr Coldcleugh noticed the great quantity of warm vapour ascending in the evenings between Villa Rica and Sabara in South America, having often the dense appearance of smoke; sudden and violent alterations of temperature were frequent, and thunder storms daily occurred with very trifling previous warning, and it was in this district precisely that he met with the greatest number of goitrous cases.* Even in the plains of Canada the variation of temperature is wonderful. In summer it is not unusual for the thermometer to rise in the shade even as high as 96°, and in winter to sink to 25° or 30° below zero. The general relaxation of the tissues caused by the oppressive state of atmosphere already alluded to, (which, carried to an extreme point and long-continued, may affect the brain and produce Cretinism,) may perhaps become more apparent in those of the throat, owing to the laboured respiration attending it; a dilatation of the cellular structure may be consequent upon it, followed by hypertrophy of the gland itself. Added to this, some peculiar electric state of the atmosphere, depending on the locality, may exist in these places, but which we are not able to explain, though the effects of this mysterious agency through the air, on the human body, are in other instances often obvious enough. These effects, however, may not perhaps necessarily depend upon the confined situation only, but the peculiar atmospheric changes may alone act as the cause.

In the Alpine parts of Tartary, goitre, as well as Cretinism, are very common, especially among the women, and the same condition of atmosphere is remarked, as that just described.

De Saussure affirms that the peasants residing in the lower valleys of the Alps, always present a greater apathy and deficiency of intellect, as well as want of expression in the features, than those who reside on the hills above them, so much so indeed, that he could readily distinguish in a market crowd almost at what altitude each individual had lived. We generally find then, that, wherever the two diseases goitre and Cretinism are very prevalent, there exists a vitiated condition of the air, quite evident to the senses, and that the inhabitants are of a languid inert disposition. This inertness may, I think, be set down as the first step towards Cretinism, taking effect, however, to that extent only on those whose lax fibre and tender age render them the most susceptible of its influence when long-continued. The nervous system must in such a case be peculiarly affected, and the brain consequently expected to eventually become subject to the influence, which is exerted on it by the atmosphere, producing the enervated and pitiable state described. On reaching a certain age and degree of strength, the system appears more able to withstand its powers, but its local effects on the neck may still occur. Strangers coming to reside in situations of this description, are thus occasionally liable to goitre only, although their infants may fall victims to Cretinism, should they remain long in the place. The French translator of Cox, mentions an instance of a Bernese and his wife, above the common rank, who came to reside in the Valais for some years, and who had one child a Cretin, while all the rest escaped.

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* Daniell's Meteorological Journal, 1823.

We must however, bear in mind, that in Nipâl where bronchocele exists to great extent, no Cretins are to be found. Mr Clift, the Conservator of our College Museum, once related to me the case of a lady in Cornwall, who, after the age of thirty, was attacked by bronchocele; it attained a large size, and her servant, who had lived with her many years, became subject to it about the same time. They were the only persons in the place who had the disease, and no reason could be assigned for its appearance in them. They had resided at this spot for several years; it was on the side of a hill, facing the south, and there was a large pond close to the house. Here we must suppose that some peculiar atmospheric influence, acting for a long period of time, had effected the change.

Although this peculiar condition of the atmosphere, whatever be its origin, may, in my opinion, be more likely to act as a cause of endemic bronchocele, than the others which have been mentioned, still I am aware that several objections may be raised, and that various facts will impress on our minds the conviction, that some other hidden and mysterious agent, as yet unexplained, may exist, and the discovery of which at some future time may unravel those difficulties which now appear to surround this subject.

ART. IV.—*Anatomical Observations.* By JOHN REID, M. D. Demonstrator of Anatomy, President of the Royal Physical and Royal Medical Societies of Edinburgh, &c. (Read before the Anatomical and Physiological Society of Edinburgh.)

I.—*Case in which accidental Cartilages were found in the interior of several of the Serous Membranes.*

ON exposing the *abdomen* of one of the subjects in the Dissecting-Rooms, we found within the cavity of the *peritoneum*, and lying in the upper part of the *pelvis*, a round cartilaginous-looking body, somewhat larger than a billiard ball, and without any attachment to the surrounding parts. With the exception of a few depressions in its surface, it was perfectly round and smooth. On making a section of the tumour, it was found to consist of a number of concentric laminae, with a calcareous deposit in the centre. It was very elastic, and the fresh section was exactly similar to the fibro-cartilage, placed between the bodies of the *vertebrae*, with this difference, that the centre of the intervertebral substance is soft and pulpy, while the centre of the tumour was occupied by the calcareous deposit.*

After a careful examination of all the parts within the *abdomen*, the only other morbid appearance that presented itself was a cartilaginous deposit on the surface of the spleen. Within the cavities of the *tunicae vaginales* of this subject, who had a double hydrocele, we also found a number of cartilaginous-looking bodies, the largest of which were loose and floating in the fluid contained there, while the smaller were connected to the inner surface of the *tunica vaginalis* by thin membranous pedicles. In making a section of the largest of these, which was oblong, and about the size of a field bean, it differed slightly in its structure from that found within the cavity of the *peritoneum*, in approaching more to the nature of cartilage than to fibro-cartilage. It also contained a calcareous deposit in its centre. Several of these bodies were also found adhering to the inner surface of both *pleurae* by slender membranous pedicles. None of these cartilages presented themselves in the articulations.

I may mention, though no way connected with the object of this communication, that, while taking out the brain of this subject, we observed a very distinct depression in the outer table of the frontal bone below its middle, apparently the effect of an injury. From the inner surface of the internal table, exactly opposite to the depression on the outer, a narrow spicula of bone about an inch in length had been thrown out. This spicula, in all probability, had made an opening through the membranes of the brain, or, at least, these had adhered so firmly to it, as to have been torn in removing the skull-cap. Upon the corresponding portion of the anterior lobe of the brain, there was a depression which might have held a hazel-nut, and which, in all probability, had been partly occupied by some serous fluid, which was observed to escape on removing the skull-cap. The surrounding portion of brain was perfectly healthy.

This subject was about eighty years of age, and had been for some time under Dr Smith's care in the City Charity-Work House. He died gradually exhausted from severe asthmatic attacks.

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* A section of this tumour, with several of the smaller cartilaginous bodies, to be described immediately, were shown at a meeting of the Medico-Chirurgical Society of Edinburgh.

Dr Smith never observed him complain of any uneasiness arising from the presence of the fibro-cartilaginous body within the cavity of the *peritoneum*. Though he had occasional delirium for a few days before death, yet it was nothing more than what is frequently observed in patients, in a very exhausted state, with an impeded circulation through the lungs.

This loose fibro-cartilaginous body found within the *abdomen* is evidently of the same origin, though differing slightly in structure from those observed within the *tunicae vaginales* and *pleurae*, and must at one time have been attached to some portion of the *peritoneum*.

The loose cartilages within the synovial membranes of the articulations, particularly that of the knee, have attracted more or less attention since the time of Ambrose Paré, as they are often attended with very disagreeable consequences, and are the subjects of surgical operation. They have been occasionally seen in great numbers in the synovial membranes of the tendons; in the *bursae mucosae*, particularly that enveloping the flexor tendons, as they pass below the annular ligament of the wrist; [*] and in the interior of serous cysts developed where they do not naturally exist. [†] In the splanchnic serous membranes, they have been seen most frequently in the *tunicae vaginales*, and rarely within the *peritoneum*, *pleurae*, and arachnoid. I am not aware of their having been found within the *pericardium*.

These cartilaginous bodies of the serous membranes appear to be of two kinds; the one of more frequent occurrence approaches nearly to cartilage in its structure; the other has a greater or less resemblance to fibro-cartilage.

I have found the following cases of the presence of these cartilaginous bodies within the cavity of the *peritoneum* recorded. Laennec states, that Littre once observed one of these bodies loose within the cavity of the *peritoneum*. Andral mentions that he has found them more than once, sometimes loose, and sometimes adhering to the inner surface of the *peritoneum*. Beclard once saw one of these bodies, which had been found loose within the *peritoneum*, of the size of a nut, consisting of concentric laminæ, with a calcareous deposit in the centre. It, in fact, exactly resembled the largest one in the case before us, except in being of a smaller size.

There is a delineation and description given of one of these tumours found adhering to the surface of the *pleura*, by Mr Wardrop, in the ninth volume of the Edinburgh Medical and Surgical Journal, which also exactly resembled in its structure the largest of these bodies in the case before us. It was of the size of a hazel-nut, and composed of concentric laminæ, surrounding a calcareous central portion.

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[*] Cruveilhier's Anatomie Pathologique, Tome i.

[†] Andral's Anatomie Pathologique, Tome i.

It must occur but very rarely to find these bodies of so large a size; and in so many of the splanchnic serous membranes in the same subject. Andral states that he has never seen them larger than a bean.

Laennec [*] seems to have satisfied himself, in examining a *tunica vaginalis*, containing some of these bodies in different stages of their growth, and where the circumstances were highly favourable for ascertaining the nature of their formation, that they were first deposited behind the serous membranes; that, as they increased in size, they pushed it before them, so as to become completely enveloped by it, and only retained in their place by a thin band of serous membrane. This band at last gives way, and they fall loose into the interior of the serous sac. Andral, while he believes that the accidental cartilages found within the original serous membranes of the body are formed in the manner described by Laennec, yet supposes that those found in the interior of cysts developed in other parts of the body may be formed in the fluid effused from the inner surface of the sac.

Dupuytren[†] and Raspail[‡] have both affirmed that the small cartilaginous bodies which occur occasionally in considerable numbers, and which have been most frequently found in a cyst connected with the annular ligament of the wrist-joint are entozoa.[§] The former rested his belief upon some supposed spontaneous movements which he observed in them; the latter draws his arguments from their structure and chemical composition, in which he supposes they resemble the eggs of an animal, which would form a new genus between the *Cysticercus* and *Coenurus*. Bosc and Dumeril, to whom Dupuytren submitted specimens of these bodies for examination, both came, however, to a different conclusion.

In dissecting a subject lately, we found a fibro-calcareous tumour about the size of a hazel nut, surrounded by a serous membrane, lying loose in the lower part of the *pelvis*, and within the sac of the *peritoneum*, which evidently owed its origin to a different source from those which we have mentioned above.

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[*] Dictionnaire des Sciences Medicales, Tome iv.

[†] Cruveilhier, Oper. cit. Tome i. p. 324.

[‡] Organic Chemistry, translated by Dr Henderson, p. 314.

[§] The history and description of these cysts point them out to be the *bursa mucosa* surrounding the flexor tendons, as they pass below the annular ligament of the wrist, distended with fluid and these cartilaginous bodies. The appearance of the double cyst is produced by the annular ligament being stretched across the distended bursa.

Deposited in the body of the *uterus*, and among loose cellular tissue between the *uterus* and external surface of the *peritoneum* in this subject, we found a great number of rounded tumours of various sizes, the largest of which were almost entirely calcareous, some of the smaller were fibro-calcareous, and others again were entirely fibrous. Two of the smaller tumours had pushed the *peritoneum* before them, and were only attached loosely by a fold of this membrane. The origin of this fibro-calcareous tumour, and the manner in which it passed into the cavity of the *peritoneum*, are sufficiently obvious, and afford an excellent illustration of Laennec's explanation of the mode by which the cartilaginous bodies found in serous membranes escape into their interior. Tumours of various kinds may in this manner become loose, and pass into the interior of any of the serous membranes of the body. My friend Dr J. Y. Simpson informs me, that he examined a preparation at Guy's Hospital Museum, in which there were continuous rows of small carcinomatous tubercles running along the course of the intercostal vessels, some of which showed a tendency to pediculation. He saw in the same museum an irregular, nodulated, roundish, white, and glistening body of the size of a walnut, which was found loose in the cavity of the *pleura*.

II.—*On the Varieties of the Obturator Artery, and the relation of these to the Femoral Ring.*

I strongly suspect that the obturator artery runs a greater risk of being wounded during the operation for strangulated femoral hernia, than many surgeons are inclined to admit; and if this be the case, the varieties in the origin and course of this artery deserve a fuller consideration than what is generally allotted to them, in the systematic works on anatomy and surgery of this country.

Mr Guthrie states, in his Essay on Femoral and Inguinal Hernia, when speaking of the danger of wounding the obturator artery in operations for strangulated femoral hernia, "that he has been made aware of more than one accident of this nature having occurred in operations performed by some of the best anatomists and surgeons in London, and the patients subsequently bled at intervals, until they died from hemorrhage." Robert * mentions, that the celebrated Mursinna, in operating for strangulated femoral hernia, in a case where the obturator artery had surrounded the neck of the sac, wounded the external coat of the artery, and that the patient died eight days after, from hemorrhage arising from a rupture of the injured artery.

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* Journal des Progres des Sciences Medicales, Tome viii. p. 193.

In 1831, I witnessed a somewhat similar case in the practice of Dupuytren at the Hotel-Dieu. The patient was a female about 60 years of age, who was brought into the hospital with well marked symptoms of strangulated femoral hernia. All the urgent symptoms ceased after the operation, and she seemed to be going on well for a fortnight, when she was seized with severe diarrhœa, which soon carried her off. On dissection, a broad sheet of effused blood was observed through the *peritoneum*, evidently placed between that membrane and the *fascia transversalis* of Sir A. Cooper, extending from the lower part of the *pelvis*, up nearly to the *umbilicus*. This was found to have taken place from the obturator artery, which in this case had arisen from the external iliac by a trunk common to it with the epigastric, and had nearly surrounded the neck of the sac, and which, during the operation, had been completely cut across. Dupuytren remarked, that the blood which escaped externally during the operation was greater than usual, but this soon ceased. Had this woman not died from the effects of the diarrhœa, it would never have been discovered that the obturator artery had been wounded. The extent of the hemorrhage was in all probability diminished, by the artery having been completely cut across.

The most common origin of the obturator artery is from the internal iliac or some of its branches; but in a great number of cases it is found to arise either directly, or much more commonly indirectly from the external iliac, by a trunk common to it with the epigastric. When it arises from the internal iliac, it is evident that it can in no way be implicated in the operation for femoral hernia, in whatever manner it may be performed. Even when it arises from the external iliac, it is but very rarely endangered in the ordinary methods of performing this operation, as it generally proceeds downwards and inwards, first passing along the outer or iliac side of the femoral ring, and then along part of its posterior margin, to reach the upper portion of the obturator *foramen*. In the rarer cases, which seem to be principally those in which the common trunk of the obturator and epigastric is longer than usual, the obturator takes a more circuitous course, passing along the upper margin of the femoral ring, and then along its inner or pubic margin. It must be evident that when a femoral hernia descends, the relative position of the artery to the neck of the sac, in these two cases, is very different, and, in a practical point of view, involves very important considerations.

We have stated that the most common, or what is considered the normal origin of this artery, is from the internal iliac, or one of its branches. The origin next in frequency is by a common trunk with the epigastric from the external iliac. More rarely it springs directly from the external iliac, and still more rarely from the femoral. Though the artery may thus arise from points placed at a considerable distance from each other, it invariably makes its way out of the *pelvis* by the same opening, viz. the upper part of the *obturator foramen.* When it is a branch of the femoral it mounts upwards along that artery, passes below Poupart's ligament, and places itself in the same position as if it had arisen within the *abdomen.*

Cloquet* examined 250 subjects; 125 females, and 125 males, for the purpose of ascertaining the relative frequency of the origin of the obturator, from the hypogastric, external iliac, and epigastric. In these the obturator arose from the hypogastric in both sides in 160; from the epigastric on both sides in 56; from the epigastric on one side, and the hypogastric on the other, in 28; from the external iliac in 6. Including both sides of the body, thus increasing the number of arteries examined to 500, and taking all the obturator arteries which arose from the hypogastric arteries, and all those which arose from epigastric arteries, or directly from the external iliac, he found that the obturator arose from the hypogastric in 348; from the epigastric or external iliac in 152. According to these results, the frequency of the origin of the obturator artery from the hypogastric are to those from the epigastric and external illiac as 3 to 1. The obturator was found to arise rather more frequently from the hypogastric in males than in females. Monro believes the relative proportion between the origin of the obturator artery from the internal iliac and its branches, and from the epigastric and external iliac, to be as 20 to 1. Velpeau † states that his observations, drawn from the examination of nearly a thousand cases, led him to coincide in Monro's opinion. Hesselbach ‡ thinks that the origin of the obturator from the external iliac and epigastric is not very common, and strangely asserts, that it rarely occurs except in females. Maneo states the proportion to be 1 in 6; Scarpa and Lawrence as 1 in 15. According to other researches § the obturator was found to arise in common with the epigastric in 12 out of 63 subjects, affected with crural hernia, and in all passed behind the neck of the sac. Meckel ‖ is of opinion that the obturator arises nearly as frequently from the epigastric and external iliac, as from the internal iliac and its branches. My own dissections have furnished me with results approaching very nearly to those of Cloquet. Of course the only conclusion that can be drawn from these discordant statements is, that the obturator arises very frequently from the external iliac, in common with the epigastric. The epigastric has been observed by Monro, Hesselbach, Lauth, and Velpeau, to arise from the obturator or some of the branches of the internal iliac, so that it might in some cases, such as in that detailed by Hesselbach, be carried to the inner side of the sac in femoral hernia. Some, as Cruveilhier,[*] maintain, that these descriptions of the origin of the epigastric from the obturator ought to be considered as nothing more than the branch which generally passes between those arteries increased beyond the usual size; but Velpeau[†] seems quite convinced of the accuracy of one at least of these descriptions from actual observation.

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* Recherches Anatomiques sur les Hernies de l'Abdomen, p. 72.

† Traité Complet d'Anatomie Chirurgicale, 2d Edit.

‡ Origine, &c. des Arter. Epig. et Obturat.

§ La Medecine Operatoire par Sabatier, p. 609. Tome iii. F. 1830.

‖ Manuel d'Anatomie Descriptive, Generale, &c, Tome ii.

Dr Barclay was the first to dissect and prepare a case of femoral hernia, in which the obturator artery passed along the pubic side of the neck of the sac. This preparation, unique at the time, was delineated in Sir A. Cooper's work on Femoral Hernia, and is now in the Barclayian part of the Museum of the Royal College of Surgeons of Edinburgh. Mr Wardrop shortly after this described a similar case, also referred to by Sir A. Cooper in the same work. Dr Monro has seen the artery passing on the pubic side of the neck of the sac three times. Dr Knox is in possession of a very beautiful preparation of this kind, in which the artery was firmly tied to the outer edge of Gimbernat's ligament.[‡] Similar cases in which the obturator artery took that course have been seen by Cloquet and Dr Thomson. Brechet[§] also refers to one. I have no doubt, indeed I know, that similar cases have been seen by others; but the extreme rarity of the occurrence having passed over, these are not now made public.

Allen Burns relates a case in which there were two femoral herniae on the same side; one protruding into the femoral ring, the other into the sheath of the vein. If the obturator artery had arisen in this case from the epigastric, it would in all probability have surrounded the greater part of the neck of the sac of the smaller hernia, protruding into the sheath of the vein.[‖] Mr

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[*] Anatomie Descriptive, Tome iii.

[†] Oper. cit.

[‡] This preparation is delineated and described in a very excellent probationary essay on the Obturator Artery, by Dr H. B. Macfarlane.

[§] Thèse sur la Hernie Femorale, p. 133.

[‖] The protrusion of a hernia into the proper sheath of the vessels, by which I mean the tendinous septa passing backwards from the posterior surface of Poupart's ligament, and upper part of the iliac portion of the *fascia lata* betweeen the artery and vein, and also on the pubic side of the vein, to the pubic portion of the *fascia lata*, must be an exceedingly rare occurrence, since this is not only prevented by the close manner in which the sheath envelopes the vessels, but more particularly by the reflexion of the *fascia transversalis* from Poupart's ligament upon the anterior sur-

Lawrence infers that the obturator artery may surround the neck of the sac, so as to become endangered in 1 of 80 cases of femoral hernia. As this calculation, however, must be formed from imperfect data, we can only regard it as an approximation to the truth.

When the obturator arises in common with the epigastric, we generally observe a small branch running in the more usual course of the obturator, and *vice versa.* Meckel supposes that in the fœtus, the obturator is always formed by two branches, one from the internal iliac, and one from the epigastric or external iliac; that these are at first of equal calibre, but, as the growth proceeds, one of them becomes arrested in its developement, and never proceeds beyond the foetal state, while the other enlarges in proportion to the increasing size of the parts which it supplies.

The epigastric generally sends two small branches over the posterior surface of Gimbernat's ligament, one of these ramifying upon the posterior surface of the pubis, the other proceeding downwards to the upper part of the obturator *foramen*, to connect itself with the obturator artery. This last branch, if we admit Meckel's views to be correct, must be regarded as forming part of the obturator artery in the fœtus, and which often becomes enlarged, while the other branch remains of the fœtal size; so that what is generally considered as the abnormal origin of the obturator artery is only the enlargement of a normal branch. In a preparation made by Mr Liston, and described and figured by Dr Monro, this branch passing between the epigastric and obturator is of unusual size. This resembles cases alluded to by Cruveilhier, where the branches from the epigastric and internal iliac forming the obturator were of equal calibre.

The obturator vein often passes up to join itself to the epigastric vein. In this course it may surround the neck of the sac. Allen Burns has seen an instance of this kind. Michelet found the internal circumflex artery in one case arising in common with the epigastric, and he supposes that if a femoral hernia had descended, it might have been pushed to the pubic side of the neck of the sac. I had an opportunity of dissecting a similar variety two winters ago; but in that case the artery would, in all probability, have lain on the iliac side of the neck of the sac. In one subject last winter I found the converse of this variety; the epigastric arose from the inter-

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face of the vessels. If, however, we with some anatomists describe the *fascia cribriformis* as the anterior part of the sheath of the vessels, and the pubic portion of the *fascia lata* which lies behind the vessels as the posterior part of their sheath, then every femoral hernia lies in the sheath of the vessels.

nal circumflex an inch and a quarter below Poupart's ligament. The artery in this case would also in all probability have been placed on the outer side of the sac, had a femoral hernia descended.

Besides the constant danger of cutting directly outwards from the position of the common femoral vein, of carrying the knife upwards and outwards to any great extent from the proximity of the origin of the epigastric artery, of cutting directly upwards, for much more than two lines in the male from the presence of the spermatic chord, we find that there are other blood-vessels, deviating from their usual course, which may occasionally present themselves to the cutting edge of the knife, in whatever manner the operation may be performed. Though no surgeon in this country would, in consequence of this, be inclined to adopt the method of dilating the stricture, yet it must deeply impress upon his mind the necessity of not extending his incisions for enlarging the stricture, beyond what is absolutely necessary for returning the contents of the hernia without violence. *

If the obturator should happen to be divided during the operation, are we to stand idly by, and not attempt to secure the cut extremities of the artery? Mr Guthrie has very properly strongly protested against such inactivity, and lays down the following directions for securing the artery. "In the male a transverse incision should be made in the line of Poupart's ligament, the tendon of the external oblique muscle cut through, and the spermatic chord exposed; this is to be drawn upwards, and kept in that situation by a bent probe. Poupart's ligament is then to be cut through until the first incision for dividing the stricture is met by that just made. The blood will now easily lead to the artery, which must be secured by a ligature, and to render this easy of execution, sufficient space and a blunt knife only can be wanted in addition to the forceps and ligature. In the female the operation is very simple, as the round ligament requires little attention being paid to it."

III.—*Malposition of the Large Intestines in two individuals, apparently causing fatal Ileus in one of them.*

CASE I. When attending two years ago an autopsy of an individual who had died of some thoracic disease, I found the following abnormal position of the large intestines. The *caput cæcum* was placed in the upper part of the left lumbar region; the colon first passed through the left lumbar region, to the lower part of the left illiac *fossa*, it then turned up again to the left lumbar region, the ascending portion lying internal to, and nearly in close apposition with the descending portion; in the left lumbar region it again formed an acute angle and again traversed the left lumbar region and left iliac *fossa*, close to and internal to the ascending portion, and then passing over the sacro-iliac synchondrosis, it terminated as usual in the *rectum*. All the large intestines were thus coiled up in the left lumbar region and left iliac *fossa*; and were firmly tied in their situation by the reflexions of the *peritoneum*. The small intestines consequently occupied that portion of the umbilical region and of the right side of the *abdomen* where the large intestines are usually placed. On dissecting out the superior mesenteric artery, I found that the arch formed by this artery, instead of presenting the usual form, was reversed; the convexity instead of looking downwards and to the left side, looked downwards and to the right. From the convexity of the arch the arteries supplying the *jejunum*, and *ileum* arose as usual, and from the concavity sprung the usual branches distributed to the large intestine. The textures of the intestine were perfectly healthy.

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* In some of the cases in which the obturator surrounds the neck of the sac, the incisions for enlarging the stricture may probably be carried for a line or two without endangering the artery.

Case II. During last summer, I assisted my friend Dr Weir of Bathgate, to examine the body of a boy about 17 years of age, who died of *ileus*. The disease had lasted ten days, and had resisted the most active and judicious treatment. The position of the large intestine in this boy exactly resembled that already described, with this trifling difference, that the *caput cæcum* was not so firmly fixed in the left lumbar region as in the other. We had the same folding of the large intestine in the left side of the *abdomen*, and the same acute angles formed at the turns of the intestine. Circumstances prevented us from ascertaining the position of the vessels in this case. Almost the whole of the *jejunum*, the *ileum*, *caput cæcum*, and colon down to the point where it formed an acute angle with the portion that turned up, were greatly distended, of a livid colour, and contained a great quantity of air and fluid feces. That portion of the large intestine below the dilated portion was much contracted. This boy had long been subject to colic pains, and these, as well as the fatal attack of *ileus*, were in all probability to be attributed to the malposition of the intestine, and the close manner in which it was bound in its situation by the *peritoneum*.

The malposition in both cases was evidently the original formation of the parts, and not the effect of disease or any other agency.

From what I have been able to learn from authors, and from conversation with several experienced anatomists, I am led to believe that the abnormal position of the large intestines here described must be a very rare occurrence.

Besides the cases of transposition of the whole of the *viscera*, various irregularities in the position of the large intestines are mentioned by practical authors, and by those engaged in elucidating the developement of the *fœtus*; some of these undoubtedly arising from original conformation, and others from disease. The most common of the former of these seems to depend upon the unusual length of the intestine, particularly of the transverse arch of the colon. Morgagni describes several cases of this kind, where the transverse arch of the colon, in passing across the upper part of the umbilical region, proceeded downwards to a greater or less extent; in some cases as far as the *pelvis*, and again turned up to the umbilical region to pursue its usual course. Mr Annesley[*] gives descriptions and delineations of similar cases. The sigmoid flexure of the colon sometimes makes a very unusual bend into the margin of the umbilical region, occasionally producing a retardation of the contents of the intestinal canal. An example of this is given by Dr Abercrombie, and another also by Mr Annesley. The ascending colon sometimes makes a similar curvature. In some cases all the different portions of the colon are of unusual length, and the large intestine takes a very irregular and winding course through the cavity of the abdomen. Annesley gives a very remarkable example of this kind. Dr Wells[†] also relates a somewhat similar case, and G. St Hilaire found it in a monstrous *fœtus*, assuming the great length peculiar to some of the lower animals. The *caput cæcum*, may be placed higher than usual, so as to lie in the right lumbar region, or towards the *umbilicus*. Annesley gives one case where it was placed in the middle of the *pelvis*, but he seems to considers this as the effect of derangement of the functions of the intestinal canal.[‡] Connected with the high position of the *cæcum*, we may have the colon passing from the umbilical region, down the centre of the *abdomen*, to terminate in the rectum.[*] These are the more interesting, as they approach nearly to the position which the large intestine occupies in the first months of fœtal developement. Meckel[†] has ascertained, that, in the early months of utero-gestation, the colon does not consist of ascending, transverse, and descending portions as in the adult, but is nearly straight; and that it is only towards the end of the fourth month that the *caput cæcum* reaches the right lumbar region. According to Serres, the position of the *caput cæcum* in the right iliac *fossa* is intimately connected with the descent of the testicle in the male, and that of the ovary in the female. In these cases, where the descent of the testicle has been arrested, he has found that of the *cæcum* also arrested.

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[*] On the Diseases of India, Vol. ii.

[†] Vol. 3d of the Transactions of a Society for improving Medical and Chirurgical Knowledge.

[‡] I have just examined the body of an aged female, who died of pleurisy, in whom the *caput cæcum* was placed loose in the lower part of the *pelvis*, and the ascending colon was firmly fixed by the peritoneum in the right iliac fossa. The sigmoid flexure, after passing into the *pelvis*, turned upon itself at an acute angle, and re-entered the left iliac region, about the middle part of which it formed another acute angle, and returned to the *pelvis*. All the abdominal viscera were quite healthy.

In examining the abdomen of a boy seven years of age, the *caput cæcum* was found lying in the right lumbar region; from this it followed its usual course, until it reached the left iliac fossa, when it crossed the spine to the right iliac fossa, where it turned upon itself and then passed into the *pelvis* on the right side. The trunk of the interior mysenteric artery, after sending off the left colic and sigmoid branch, passed to the right of the spine, accompanying the intestine. The testicles had descended.

The high position of the *caput cæcum* and the descent of the colon through the centre of the *abdomen* are only the persistence of an arrangement which is perfectly normal in the fœtus, at a certain stage of its developement. According to Meckel, the descending colon describes a larger curvature in the left iliac *fossa* in the *fœtus*, during the latter months of utero-gestation, so that this appearance in the adult is only the continuance of the arrangement peculiar to the fœtus at that period.

Though many of the abnormal appearances in the adult can be beautifully and most satisfactorily accounted for by the arrestment of the developement, yet there are others which have as yet baffled all the ingenuity and industry of those celebrated anatomists and physiologists who have thrown so much light upon this subject; and among these we may at present class the two cases of malposition of the larger intestine which I have here detailed.

We must regard the contracted portion of the intestine, situated below the dilated portion in the fatal case of ileus, as quite healthy. A contracted state of a greater or less portion of the intestinal canal is so frequent an appearance after death, where we have no reason to suppose that its functions were deranged during life, that it cannot of itself be considered morbid. That the intestine below the dilated portion should become contracted is, in fact, nothing more than what we would expect, since it is a general law in the animal economy, that when the usual substances cease to pass along any tube or duct, its calibre soon becomes diminished, and is ultimately entirely obliterated. So in a case of *ileus*, when the *ingesta* are retarded for many days together at a particular point, it is nothing remarkable that the portion of the intestine below this should contract upon itself.

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[*] For example of the passage of the transverse arch of the colon down the centre of the abdomen to terminate in the rectum, see Morgagni de Sed. et Caus. Morb. Lib. II. Epist. 17 et Lib. III. Epist. 34.

[†] Manuel d'Anatomie Generale, Descriptive, &c. Tom. ii.

While performing a series of experiments upon frogs some short time ago, with the view of illustrating how far the contractility of the muscular fibre is dependent upon the central organs of the nervous system, I was often struck with the rapidity with which inflammation of the muscular tissue destroyed its contractility, so that it refused to contract even upon the application of galvanism. This is in perfect accordance with Dr Abercrombie's theory of the pathology of *ileus*.

IV.—*Permanent Flexion of the Fingers from Shortening and Thickening of the Palmar Aponeurosis.*

In a muscular and aged male subject in the Dissecting-Rooms, the little and ring-fingers in one hand were firmly and permanently bent; and the same fingers in the opposite hand were also flexed, but in a much less degree. On removing the integuments of the palm of the hand, this was found to depend upon very great thickening and shortening of the palmar *aponeurosis*. The *aponeurosis* in the fingers most affected extended beyond the metacarpal phalangean articulations, towards the distal end of the proximal *phalanges*. On cutting through the palmar *aponeurosis* we observed a circumstance which has not been alluded to by Dupuytren,* and on account of which I have thought the case worthy of notice.

We found that the ring-finger could only be extended very partially, and the little finger still less, after the *aponeurosis* and tendons had been freely divided. All the articulations of the affected fingers were perfectly healthy, and the only explanation of the continued flexion that we could give, was, that the ligaments connecting the articulations, from their being long constrained to one position, had accommodated themselves to their altered circumstances. We have seen the same thing twice in the knee-joint. In two cases of disease of the hip-joint, the knee-joint of the same side presented every appearance of having been also affected, but on dissecting them we found that all the textures entering into the formation of the joint were perfectly sound, and the only cause which we could discover for the bent position of the limb was a shortening of those ligaments which are relaxed in flexion.

If an operation had been attempted in this case, the division of the palmar *aponeurosis* would have produced little immediate benefit, and might have prejudiced the minds of some against performing the operation in the cases favourable for it. It is probable that continued extension would have the effect of restoring the ligaments to their former state.

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* Leçons Orales, Tome i.

I would not wish it to be inferred that the muscles had not also accommodated themselves to the circumstances under which they had been for a long time placed, and that they would not also have strongly resisted for a time any efforts made to move the articular surfaces upon each other. Upon the extent of the muscular shortening in these cases we had no data to offer any opinion, as it would have been necessary to have first cut through the ligaments of the joint to have enabled us to ascertain this.

The previous history of this man could not be obtained.

Since the above description was written, I have perused a short but excellent paper on the permanent flexion of the fingers by M. G. Geyrand, Surgeon to the l'Hotel-Dieu d'Aix, contained in the 4th fasciculus of the Memoires de l'Academie Royale de Medecine for 1833. M. Geyrand there gives a very minute and detailed account of a dissection of a case of this kind, where the palmar *aponeurosis* and flexor tendons were perfectly natural, and where the fingers were held in flexion by fibrous chords, which he considered to be of new formation, running from the palmar *aponeurosis* to be inserted into the fibrous sheaths surrounding the flexor tendons. Some of these chords were attached to the first phalanx, others went on to the second, and others again passed between one phalanx and another. All these bands were composed of parallel fibres. In the fresh state they were very resisting, altogether inextensible, and had the whiteness and aspect of ligaments. M. Geyrand argues from the facts ascertained in this dissection, from the appearances observed in two other cases which he had an opportunity of examining on the living body, and also from the account given by Dupuytren himself, of the different steps of one of his operations where he must have cut one of these fibrous bands, running upon the anterior surface of the first phalanx, that Dupuytren must have misunderstood the cause of the retraction of the fingers, when he attributed it to a crisping up of the palmar *aponeurosis.* But as Sanson, in his report upon this memoir of M. Geyrand states, it is quite impossible that Dupuytren could have made any mistake of this kind in the case which he dissected after death, and which first unfolded to him the true nature of the disease, so that we must conclude that the developement of these fibrous bands may produce permanent retraction of the fingers in the same manner as the shortening and thickening of the palmar *aponeuro-*

sis does, and that these may effect this independently of each other. Sanson is inclined to believe that these fibrous bands are the exaggeration of a cellulo-fibrous tissue passing from the *aponeurosis* forwards to the *phalanges*, the rudiments of which exist in the sound state.

In the dissection which we detailed above, the flexion evidently depended both upon a thickening and shortening of the palmar *aponeurosis*, and upon the presence of the fibrous bands passing from its anterior part towards the distal end of the first phalanx, and exactly resembling it in structure. The alteration in the palmar *aponeurosis* itself was to a considerable extent, and perfectly obvious.

Art. V.—*Observations on the Statistics of Hernia, and on the Anatomical causes which determine its Production.* By Robert Knox, M. D., F. R. S. E., Lecturer on Anatomy; Corresponding member of the French Academy of Medicine; Fellow of the College of Surgeons, and of the Med. Chir. Society in Edinburgh. (Read before the Medico-Chirurgical Society in Edinburgh, Session 1835–36.)

When surgeons in extensive practice, or practical anatomists meet with a considerable number of cases of any particular disease, they are naturally apt to infer that such cases must be frequent: that in fact, what is seen by them must likewise fall under the cognizance of others. Having seen, for example, a considerable number of hernia cases occur some years ago in Practical rooms, the inference I drew from this was, that the disease must be comparatively frequent, a conclusion arrived at the more readily, that it accorded with what I had then read in valuable works, and what I had heard from distinguished practical men; but when I endeavoured to submit to calculation what I knew, so as to ascertain the ratio of such cases to others, or to the mass of the population generally, I soon found that all the elements of a sound statistical inquiry were wanting, in so far at least as my own observations extended. Reflecting next on what I had many years ago read and seen, a suspicion arose in my mind that the statements of medical writers on the question of the frequency of hernia, the ratio of cases occurring in any class of the general population, the numbers reducible to those irreducible, &c. would not bear inquiry; and that these statements generally, would turn out when scrutinized to be mere surmises like my own; mere conjectures, in fact, either totally useless, or as when put forth pompously with the semblance, but without the fidelity of real inquiry, worse than useless, as misleading those putting confidence in them. In hopes of directing the attention of others more favourably situated than myself to this inquiry, I shall venture briefly to submit to the Society a few observations and reflections which have occurred to me.

If the predisposing causes of hernia were well understood, conjectures approaching to a useful approximation might be made, in respect to the greater liability of any part of the population to hernia; and though such approximations are never good, they yet supply the place of a more precise statistical account. But in respect to hernia, the medical works I have consulted do not furnish even this. No one I think, could venture to state from positive data known to him, whether hernia be more liable to affect the sedentary or the laborious, the wealthy or the poor, the young or the old; at least if data exist for the precise determination of these questions, I am not acquainted with them. Dr Monro in his admirable work on the Gullet, does, indeed, quote the records of the Rupture Society of London, as furnishing data for estimating the proportion of persons afflicted with hernia, and Mr Turnbull, surgeon to the Institution, states the average, as "1 to 15 male and female of all ages." But in order to judge of the accuracy of these data, the calculations should be before us; 1 to 15 is between 6 and 7 per cent. Now this average, judging from what I have accidentally seen in dissecting-rooms, I should at one time have thought not much overrated, but mature reflection has shewn me the danger of trusting to such sweeping statements, got up without proper materials. Dr Monro thinks this average of nearly 7 per cent. to be the truth, although we have in his own work a statement of foreign recruits of the German legion examined by Dr Verstrum, and others, which runs thus: Number of recruits examined, 40,460; number rejected for hernia, 365, or less than 1 per cent.; and yet these Germans must have been generally drawn from the lower orders and poorer classes, who, aware that the exigencies of war were at that time pressing, must have been sensible that the inspector of recruits for the British service would not be over fastidious in his choice. Here, then, of 40,460 young Germans of the lower classes, the number of ruptured was not 1 per cent. Supposing the women and children of their population to have been ruptured in the same proportion, (which cannot even be imagined) we should still scarcely have 2¼ per cent. for hernia cases of all ages; this average contrasts singularly with 7 per cent., and still more with an average I have calculated from the results of the conscription of three years in the French service, which average gives a ratio of only 1⅛ per cent. upon the whole male population.

The Memoirs of the French Academy of Surgery, furnish perhaps better data, as drawn from more varied sources:

Received into the Salpetrière	7027 women,
Of these were ruptured,	220 do,
Received into the Bicetre,	3800 men,
Ruptured,	212 do,
Received into the Hotel des Invalids,	2000 men,
Ruptured,	155 do,
Received into the Hopital de la Pitie,	1037 young men,
Ruptured,	21 do.

These are the best data on record, and they give averages exceedingly low, compared to the general statements of surgical writers.

It is not even known if particular races are more liable to hernia than others, and in respect to nations the question is equally obscure. At this point, in order to be of any value statistically, the inquiry should commence, 1*st*, Are the dark races of men equally subject to hernia with the fair? I myself have never observed a case of hernia occurring in any unmixed dark-coloured savage race, although I have seen many thousand individuals; yet they lead an indolent life so long as they can; necessity then drives them to extraordinary efforts, as in the chase, which efforts they seem to meet with perfect impunity.

On the other hand, I am well aware that hernia frequently attacks mulattoes. In respect to nations, many are composed of the same race, although in very different states of civilisation; some being mostly agricultural, others manufacturing, and others still nomade or pastoral: to ascertain in what respect these various conditions of life affect the great national masses would be exceedingly interesting. Medical men generally have attempted the determination of these questions, not by statistics, I fear, but by conjecture. The frequency of hernia in Switzerland was noticed by Freytag, (1721,) and by Blumenbach, who particularly singles out the district of Apenzell, as presenting numerous instances of this surgical accident. He gives many ingenious reasons why it should be frequent in Apenzell, but the first point to be determined is the fact itself: Is hernia more frequent in Apenzell than elsewhere? Is hernia more common in mountain districts (as some have asserted), for example in the north of Scotland and in Wales, and in some parts of Ireland, than in the extensive plains of England or of France? I am sure that myself and many others would be gratified to have pointed out to us the calculations upon which such statements have been made.

Mr Lawrence, a classical medical authority on hernia, says, that the accident is more common in the labouring classes of the community than in others; and for the same reason more frequent in the male than in the female sex; and on the right than on the left side of the body. (p. 33.) All this is extremely probable, but then it is merely probable, no exact data existing in confirmation of these statements.

The inhabitants of the Cape never labour at all; at least so it appeared to me in respect to the farmers on the northern and eastern frontier of the colony, and Mr Barrow has recorded the indolence of the colonists as incredible and extreme. In this respect I presume they act like other men; there being no necessity for labour they very naturally avoid it. Yet they are said to be much subject to hernia. That I may not fall into the error just censured, of speaking and writing from no positive data, I had better mention the circumstance that first led me to notice the fact; if correct, and of it I have little doubt, it proves that here is a healthy well-formed race who never labour, and who yet are peculiarly subject to hernia. I acted for some months as surgeon to a corps of yeomanry, perhaps about 900 strong, and composed almost exclusively of Dutch farmers and their sons, and of all ages; one of these farmers a mulatto, however, claimed exemption from active service, on account of a large and pendulous tumour, growing from the inside of the thigh, and on examining this tumour, I also remarked an inguinal hernia. My report to the commanding officer, an affluent Dutchman, was, that I thought this man should not proceed with us, on two grounds, first, by reason of the tumour, and secondly, on account of a hernia for which he had no truss. The commanding officer cautioned me not to sanction the hernia as a cause, else we might have to discharge a third at least of the men next day; for he verily believed that a third of the corps was subject to that troublesome accident to which he himself also was liable. Allowing the statement to be a little exaggerated, yet it argues a frequency of hernia in a race of men enjoying the greatest ease and comfort, almost without a parallel; but they are very much on horseback, and to this perhaps may be attributed a complaint, which just now we have seen ascribed to labour. I ought to mention also their great disposition to corpulency. With the medical theorist we are forced to shift our ground, and next inquire into exercise on horseback as a cause of hernia. *

That hernia is frequent at the Cape where most persons ride much on horseback may be admitted, though in what proportion to the population or to other surgical diseases, it is impossible to say: but is it frequent amongst the Cossacks, the Tartars,

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* To the credit of this corps of yeomanry, it ought to be mentioned, that none claimed exemption from service on the score of hernia, and very few from any cause whatever: even the individual above alluded to was not a pure Dutchman but of a half-breed. I have sometimes fancied that hernia is frequent in mulattoes, but my observations ar not sufficiently extensive to warrant any conclusion.

the Mexicans, the Chilians, and the singular race of Poens, whose equestrian habits have been so often described? I am disposed to ascribe frequency of hernia at the Cape to other causes, and therefore, require it to be ascertained, that exercise on horseback does positively cause hernia in other nations; if it give rise to the accident with the Dutch, a Saxon race, it ought to produce the same effect with the nations and races just enumerated.

Many think that sedentary habits frequently occasion or predispose to ruptures; but the difficulty of getting at positive data is very great, for thousands have ruptures who never wear any truss, nor ever think of mentioning the circumstance to a medical man. Cavalry regiments are said to be ruptured in a much greater proportion than foot-soldiers, but in what proportion none has stated, so far as I know. Soemmering and Blumenbach, names respectable enough in science, ascribed the frequency of hernia amongst the Swiss and Dutch to their living so much on milk, cheese, and potatoes. Any remarks on such opinions seem quite unnecessary.

There is an anatomical structure which when present seems to me positively to predispose greatly to hernia, I mean great width of pelvis, and consequently increase in measurements of this cavity whether male or female. I remember examining the pelvis in a male who had double ruptures on each side, that is an inguinal and ventro-inguinal and femoral hernia on both sides; the size of the pelvis was much greater than is usually met with in the male, in fact it approached that of the female, in all its dimensions, but before it was practicable to measure it when stripped of its soft parts, and then compare it with others, the specimen was lost. My impression was, that it nearly equalled in all its dimensions a full-grown female pelvis. Moreover, in two cases of strangulated crural hernia which I had occasion to see in the male, the pelvis in both was much larger than usual,* in fact it approached the female in its dimensions. I regret exceedingly that I had no opportunity of measuring the pelvis in these cases; but from what I have seen I feel disposed to think, that an unusual size of pelvis in the male is a frequent predisposing cause of inguinal hernia, and when extreme, even of crural hernia, which is not so uncommon in the male as some have supposed. The hernia had not been detected during life in the two cases I speak of, and they died in consequence of strangulation.

The ratio of hernia in respect to male and female falls next to be considered. Mr Lawrence says, (p. 33,) that from a Report of the City of London Truss Society for the year 1814, it appears, that of 7,599 persons to whom that institution had afforded relief from the period of its first establishment, 6.458 were males and 1.141 females.

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* The hernia was on the right side for a reason I shall endeavour to explain immediately.

The new rupture society had relieved 3,505 males and 565 females,* but I cannot consider this as affording any data for establishing the relative frequency of hernia in the sexes; it merely shews that more males apply for relief than females,—a circumstance every one must know very likely to happen in hernia.

In respect to the ratio of occurrence on the right or left side, the following table exhibits all I am acquainted with on the subject.

Tabular view of the comparative frequency of inguinal and crural hernia on the right and left sides.

Of 7,599 cases of hernia there were, of

Inguinal Hernia,	Males,	2567	Right side.	1469	Left side.
do.	Females,	20	do.	14	do.
Femoral Hernia,	Females,	264	Right side.	246	Left side.
do.	Males,	47	do.	38	do.

Ratio, according to the Report of the New Rupture Society.

Inguinal Hernia,	Male,	1563	Right side.	927	Left side.
do.	Female,	51	do.	34	do.
Femoral Hernia,	Female,	139	Right side.	93	Left side.
do.	Male,	19	do,	11	do.

It is right to remark, that trusses may have been distributed to those not affected with hernia but with swollen inguinal glands, an occurence by no means unfrequent. I repeat, that I do not think that these reports, which have been so often quoted, are at all to be depended on in a statistical point of view. They furnish valuable data as to the relative proportion of the different kinds of hernia to each other, but none in respect to the average compared to the general population.

There is one ratio certain, viz. that males are most subject to inguinal, and females to crural hernia; but the exact ratio is not known from extensive data. All agree that the cause is the difference in the capacities of the apertures by which hernia descend being reversed in the sexes; the notion that any influence as to producing the accident of femoral hernia in the female is attributable to the comparative smallness of Gimbernat's ligament in them,† is without the slightest foundation, and is at once refuted by an appeal to a correct descriptive anatomy, which shows that Gimbernat's ligament is often larger in females than in males, and that its comparative smallness can never be assigned as a cause of hernia in them.

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* Medical and Physical Journal, Vol. xxxi. p. 168, as quoted by Mr Lawrence.

† Monro.

It is denied positively that the great numerical disproportion between right and left ruptures depends on any disparity between the apertures of the two sides, and the difference has been referred by Mr Lawrence, M. Jules Cloquet, and by others, to the employment of the right side in those offices of life which require the most powerful exertion. Notwithstanding these, the highest authorities, I feel disposed to think differently, and to imagine that the cause really depends on the larger capacity of the right side of the pelvis compared with the left. Admitting the ingenuity of the explanation of M. Cloquet, that when we raise a heavy weight with the right hand, the abdominal muscles of the right side are both relaxed and put on the stretch by the action of the diaphragm and the pressure of the abdominal viscera, it yet occurs to me, that if we were about to raise a very heavy weight, we should use both hands, in which case the pressure on the abdominal rings would be equal or nearly so. On the other hand, it is a fact which admits of no sort of question, that the right side of the body has a strength and bulk superior in most persons to the left side, and this vigour extends even as I think to processes of healing, or at least of resisting disease, for I have often counted the ulcers on the limbs in large hospitals, and have always found them more numerous on the left than on the right side. It becomes then an interesting question, why, in respect to rupture, the stronger side of the body should shew a weakness.

I have already stated, that, in those having double ruptures on either side, an inguinal and ventro-inguinal for example, the pelvis, so far as I have observed, is uniformly of large dimensions. The same observation holds in respect to those males subject to crural hernia. I speak merely of what I have seen.

I next attempted to ascertain, by measurement, if the right side of the pelvis has a greater development than the left, and what ratio; but after several attempts I found it extremely difficult to prove by the compasses to how much the difference amounted. It was obvious that in the specimens examined, by far the greater number shewed a greater width of pelvis on the right side than on the left. I speak of the measurement from the *symphysis pubis* to the base of the anterior and inferior spinous process of the *ilium*; whilst in a few the left side was rather the wider, and in others the parts were quite symmetrical. I found the same discrepancies in regard to the *foramen obturatorium*. But there is a form of male pelvis, frequent enough, and which convinces me that there is a tendency to a greater development of the pelvis on the right side. The form of which I speak is one where the left *ramus* of the *pubis* descends almost straight to meet the corresponding *ramus* of the *ischion*, whilst on the right side the ramus arches widely out, producing a singular want of symmetry in the arch of the *pubes*. The same want of symmetry happens not unfrequently with the clavicles, which may be the reason why, generally speaking, the surgeon finds more room above the right clavicle for the ligature of the corresponding subclavian artery than above the left, which not unfrequently is smaller, shorter, and less arched. I have subjoined outlines of the three extreme forms which the arch of the pubes assumes, figure 1st (Plate II.,) shewing the perfectly acute or pointed arch, a form, I presume, which induced M. Meckel to call it the "angle of the pubes" in the male; 2d, The rounded arch of the well formed female pelvis; 3d, The asymmetrical or hermaphrodite pelvis, in which the two sides are formed on different plans,—the right almost uniformly presenting a much greater capacity than the left side, but which difference, for obvious reasons, can scarcely be ascertained by actual measurement. This form of pelvis is by no means unfrequent in the male.

Of the comparative frequency of the different kinds of hernia, we have in authors some curious notices, and likewise some data which are more certain. In the former class I place a statement by Mr Marshall,[*] to the following effect. "Ventral and umbilical herniæ are commonly slight, and rarely affect the efficiency of the recruit:" Does this mean that a recruit may be passed though liable to ventral or umbilical hernia? It may also very naturally be asked, is umbilical hernia frequent in men, and in what ratio? In a future part of the work, Mr Marshall answers some of these questions, and offers some data for deciding on the comparative frequency of hernia in the lower orders of the labouring classes. I reckon recruits for the army amongst the labouring classes, although perhaps, those who ultimately join the army as private soldiers have previously laboured as little as possible. Of 6229 recruits, inspected from December 1824 to December 1825, Mr Marshall says, there were rejected for hernia 82, or about one and a third per cent. Of every 400 men, about five had hernia, a ratio at variance with all the more generally received notions, but which may, nevertheless, approach the truth, in respect to that class of persons who offer themselves as recruits. Of these 6229 recruits examined by Mr Marshall, there were also rejected for laxity or enlargement of both rings, 19; laxity or enlargement of the right side, 6; laxity or enlargement of the left do., 56;—a vast disproportion in favour of the left side, contrary to, and irreconcileable with the observations of all others, in regard to the actual greater frequency of hernia on the right side.

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[*] Hints to Young Medical Officers, &c. London, 1828, p. 81.

There is also another singularity or two in these reports by Mr Marshall, which have struck me forcibly. Of the hernia there were, Inguinal, both sides, 1; right side, 14; left side, 17; ventral, 44; umbilical, 6. The greater frequency of hernia of the left side is at variance with the statements of Mr Lawrence and M. Jules Cloquet, and of all others. So far then the report of Mr Marshall is quite peculiar. The other singularity is the astonishing number of cases of ventral hernia (44,) a number greater I imagine than could have been seen by any three of the best employed surgeons in Britain. I am sure Surgeons would have felt exceedingly obliged to Mr Marshall if he had stated through what parts exactly these herniæ protruded; for such cases are but rarely seen by the profession; and I further take the liberty of recommending to Mr Marshall's attention, but in perfect good humour and without intending any offence, that chapter in Mr Lawrence's work entitled "On Fatty Tumours on the *linea alba*, resembling ruptures." The number of umbilical herniae (6) occurring in active young men, equally surprises me. M. Cloquet dissected 457 cases of hernia, and amongst these were only 3 in men, "umbilicales et de la ligne blanche," in other words, of 457 cases of hernia, selected from many thousand dead, M. Cloquet met with three only in man, "umbilical and ventral." Of 82 cases seen by Mr Marshall, 50 were ventral and umbilical. Of 7599 cases relieved by the London Truss Society, there were only 44 ventral. We must leave to Mr Marshall the part of explaining these cases.

A second tabular view of recruits inspected at the depôt Dublin, gives, out of 4018 inspected, 18 rejected for hernia, or a ratio of not one in 200 grown up adult males, in the prime of life, and of whom 3243 were approved as being of a sound constitution, and unexceptionably made in every respect.

A third report of 2588 inspected recruits gives 16 rejected for hernia. The total will stand thus:

Recruits Inspected	2588	Rejected for hernia,	16
	4018	- - -	18
	6229	- - -	82
	12,835		116 a ratio under 1 per cent.

I confess I cannot refrain from asking the following question: Does it appear from these data that hernia is a prevalent disease? [*] I once thought so, and with certain limitations, I think so still. I believe hernia to be not uncommon amongst the really labouring and hard-working classes, but in what ratio it is impossible to say; whilst on the other hand, whole classes of society, those, viz. who do not labour, those who, whether rich or poor, live chiefly by the labour of others, are almost exempt from it. We have seen that those who offer themselves as recruits for the army in this country are remarkably free from this complaint. The following tabular view, drawn up from data in respect to the accuracy of which there can be no doubt, sets this fact also in a striking light. In 86 persons of the poorer but non-labouring classes of Society, and who had died of every variety of disease, and were examined with the most scrupulous attention to this fact, there did not occur a single instance of hernia of any sort. I subjoin their age and sex.

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[*] Dr Monro says, "the importance of the subject must be apparent to every one who reflects on the prevalence of the disease." P. 864.

Chaussier estimates the ruptured at "le trentième des hommes." Arnaud, Juville, and Antonio Gimbernat at a fifteenth of the whole population in Italy and Spain, a twentieth in France and England, and a thirtieth in the north of Europe. The author of the Art. Hern. Dict. 1824, (Maret), thinks the first of these calculations exaggerated.

Tabular View.

Males. *Ages.*	*Females.* *Ages.*	*Males.* *Ages.*	*Females.* *Ages.*	*Females.* *Ages.*
years 60	30	28	75	68
60	36	61	33	4
21	40	32	20	78
35	2	46	75	68
60	65	37	70	40
28	40	8	44	56
50	83	75	40	45
65	24	87	21	65
75	14	45	68	67
22	20	80	84	54
5	46	30	10	12
85	35	64	83	17
42	84	35	84	75
months 1	80	9	60	76
years 7	40	—	4	60
60	25	Total, 33	30	25
75	30		75	—
58	76			Total, 53
months 14	34		Total, 82.—Average age, male, 44	
	68			do. female, 58

Remarks.—These cases were not selected, but taken consecutively and in one continuous period of time, during which, as may be observed, no case of hernia occurred. These persons were of the lowest orders.

Throughout these remarks, my object has been to shew, that the statistics of hernia have not been fully investigated. First, the average number to the whole male population is not known, nor the periods of life when it most frequently happens. Secondly, the same data are wanting in respect to the female population. Neither is it known what classes of the community are most liable to hernia; the precise influence of being much on horseback; the difference, for example, between the cavalry and infantry of an army in respect to the frequency of hernia is still unknown.

A valuable fact has been stated by M. Jules Cloquet, viz. that of 8000 dead there were 457 cases of hernia* dissected by him, which dissections formed the materials for his valuable monograph on hernia. He in this way obtained the ratio which hernia cases bear to the total number of the unclaimed adult of both sexes who died in the great hospitals of Paris, but not of all ages; this would have required an examination of the records of deaths in the hospital of La Maternité.

The surgical statistics, if I may so say, of this disease, are not well known, and it is unreasonable to expect that they should be so. Few publish their unsuccessful practice. It was some years ago generally understood, if I rightly remember, that the continental surgeon was generally more successful than the British in his operations for strangulated hernia; and the fact, if it was so, was explained by showing that French surgeons bestowed but little time on the taxis, proceeding with the least possible delay to the operation for relieving the strangulated parts by incisions. All that I saw in the hospitals of the Hotel Dieu and La Charité of Paris, convinced me that these statements were well founded, and that French surgeons were extremely successful in cases of strangulated hernia which came to operation. I must not, however, refrain from mentioning here, that two Scottish provincial distinguished surgeons, Mr Crichton of Dundee, and the late Mr Turnbull of Dunbar, assured me that they had not in the course of a very long and extensive practise, met with a case of hernia irreducible by the taxis. Nothing but accurate hospital records can reconcile these conflicting statements. I think I have seen many cases of strangulated hernia altogether irreducible by the taxis. I observe by a late number of the Lancet, that Mr Liston now leans favourably to this side of the question; this distinguished operator thinks, that most cases of hernia may be reduced by the taxis. On the other hand, the continental surgeons I have met with are of opinion that, in this country, we trust too much to these means, delaying the operation so long, that, when ultimately performed, it merely hastens the patient's death. I could give numerous cases positively confirmative of these statements; and the frequent fatality of the operation for strangulated hernia was a matter of notoriety about twenty years ago in London, whilst its success in France was unquestionable, or at least unquestioned. Nothing but authentic, and in some measure official statistics of hospital practice, can put an end to these conflicting and ever-fluctuating opinions of surgeons, and relieve

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[*] Dict. de Med. 1824, Art. Her. p. 84.

the young practitioner, under trying circumstances, from much embarrassment. The necessity for the occasional publication of "Anomalous Cases," might also be thereby done away with.

The ratio of the greater frequency of hernia in men than in women has been stated, but we have no proofs that so great a disproportion as 307 to 150 really exists; other data scattered through medical authors are not worth summing up. The tabular view I have submitted to the society, renders it probable that the very poorest classes are not more subject to the disease than those more fortunately placed in worldly circumstances.

Sailors seem to me a class of men much exposed to those causes which surgeons deem the efficient or exciting causes of ruptures; viz. sudden and great exertion, pressure on the abdomen whilst reefing the sails, &c. and likewise to hard labour, loading and unloading the stores, cargoes, &c.; but I have not heard that many are discharged for hernia from our service. The statistics, if they exist, have not been published.

To me it appears, that simple authentic records of any large hospital can alone decide most of these points, give a proper confidence to the young practitioner in respect to the steps he ought to adopt in these trying and difficult cases, and put the profession generally in possession of much useful information. Select clinical cases without doubt have also their value; they illustrate and extend pathology and physiology; and when fully authenticated, they impress the public favourably with the advantage, in a surgical point of view, of hospital institutions; but they cannot for a moment be put in competition with a plain tabular narration of the number of cases (without exception,) of any particular disease admitted during a given period; the numbers treated successfully without operation; the numbers operated on; the number dead in consequence. These views alone interest the profession generally. The former have but a limited and a local interest, and are sometimes even of doubtful utility.

Since writing these remarks I have consulted Sir G. Ballingall as to the question of the comparative frequency of the different kinds of hernia, and with his permission I subjoin his remarks. My reason for troubling Sir George with these queries was, that having been for many years a military surgeon on active service in all climates, and afterwards surgeon to a large civil hospital, a field for comparison had thus been opened to him, which must necessarily fall to the lot of few.*

Sir George first referred me to a passage in the Outlines† which had escaped my notice. He there states that "hernia cases are very rare in military life, and that for thirteen years he had no occasion to operate for strangulated hernia." I remember whilst surgeon to the Department hospital, Chelsea, I saw a good number of invalids who were ruptured, on their return from regimental service in the East and West Indies; but hernia must without doubt, as Sir George has remarked, be a rare disease in military life. This inference might also be drawn from the manner in which recruits are selected for the service, those being carefully rejected who show even a slight tendency to this ailment.

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* Sir George Ballingall is, so far as I know, the only surgeon who has had the candour and courage to publish an account of his successful and unsuccessful operations for strangulated hernia, including all cases, "anomalous" and others.

† Outlines of Military Surgery, by Sir George Ballingall, p. 347.

I next applied to Sir George for information respecting the statistics of the French, Prussian, and Russian armies, and he had the kindness to point out Isfordink and Coche as being the sources most likely to obtain information. My former pupil, Mr Gavin, had the kindness to examine the former of these authors and several others for me, but without any success.

The French armies being raised by conscription, and, as is presumable, from all classes, the service of their "recruitement" might be supposed an ample field for the decision of the statistics of hernia, in as far as regards the male population. But there exists a difficulty even here. Men of high spirit and delicacy, have been known to allow the conscription law to be put in force respecting them, preferring rather to conceal the circumstance of their being ruptured than claim exemption on such a ground. The following statement I copy from a very valuable though non-professional periodical,* which I peruse regularly with much pleasure.

French Conscription.

Years.	*Force of the class.*	*Exempted for hernia.*	*Averages.*
1831,	295,978	4,044	Force 286,429,
1832,	277,477	3,579	average cases of ex-
1833,	286,420	4,222	emption from hernia, 3,948.
			Ratio 1.3 per cent,

Ratio of rejection from all other disabilities, default of stature excepted, 6.7 per cent.

Whilst these sheets were going to the press, a friend (Mr Thomson) aware of my inquiries respecting hernia, furnished me with the following notice, which he copied from the Globe newspaper, of date April 13th. "The Rupture Society of London held a meeting last week. This society has been instituted since 1805. From the records kept by them, it appears one in fifteen at least (of both sexes) are affected with this complaint, and among such as are exposed to great bodily exertion, the average is one in eight or nine.

"31,400 cases have been relieved by this society since 1805."

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* The Athenæum, No. 435, 1836.

These averages are completely at variance with those endeavoured to be established in the preceding pages. There are whole classes of society nearly exempt from hernia; the *very rich* for example, and also, as I think, *the mendicant by trade.*

Art. VI.—*Remarks on the lately discovered Microscopic Entozoa, infesting the muscles of the human body; with some observations on a similar animal found beneath the intestinal mucous membrane of the horse.* By Dr Knox, Fellow of the Royal Society of Edinburgh, and Corresponding Member of the Royal Academy of Medicine of France.

1. During the winter of 1835, in the dissecting rooms of London, a microscopic entozoon was discovered, infesting the muscles of the human body, and various interesting accounts of the parasite were published in the Medical Gazette, first by Mr Hilton [*] who discovered the cysts, and secondly by Mr Paget, who discovered the worm inhabiting the cyst; and subsequently additional observations were made by Dr Farre, and Mr Owen.[†]

Since then, parasites of a very similar character, if not identical, have been observed in dead bodies in Ireland, and in France; but I am not aware that they have been as yet remarked in Scotland, until accidentally noticed in the practical rooms which I conduct.[‡]

Having observed them myself with very great care, and been aided by my brother, who is much versed in the examination of minute objects under the microscope, I have thought that the result of these observations might be interesting to the public generally, even although they should go no farther than to confirm the results of preceding inquirers.

The person from whom these entozoa were taken, had died of diarrhœa, and was about 65 years of age. There was nothing very remarkable in regard to her mode of living, excepting that the attending physician has characterized her as by no means over cleanly in her habits, or nice in respect to food; she was in fact rather gluttonous. She shewed during life no remarkable symptoms of debility, nor any appearance whatever of constitutional disease, whether scrofulous, venereal, or otherwise. The case being one in which delayed interment was permitted, afforded ample opportunities for the examination of every muscle, and indeed of every individual texture throughout; but after the most minute inspection, the cysts containing the parasitical worms, could not be found in any texture but one, viz. the cellular tissue surrounding the muscles of voluntary motion, and in the same tissue enclosing and connecting the muscular fasciculi to each other. The cysts enclosing the parasites lay with their long axis following the direction of the muscular fibres.

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[*] London Medical Gazette, 1835.

[†] Trans. Zool. Soc. Vol. i. part 4.

[‡] The cysts were dissected, and the contained parasites shewn by my brother to two or three hundred medical men, and specimens of the muscles so affected, were sent freely to all the scientific observers in town, desirous of having them.

Cysts.—Although very numerous in many muscles, as in the pectoralis minor, the sterno-hyoideus, sterno-thyroideus, &c. there were yet very considerable intervals between them in general, and this is worthy of notice, because Mr Owen says that 25 were found in the *tensor tympani* muscle, a number almost incredible.

I shall first speak of the cysts enclosing the worms, certainly by no means the least curious part of the phenomenon. These are oval or egg-shaped, being rounded at their extremities, unless touched with an instrument.[*] They are composed of a rough granular looking membrane on the outside, and a smoother one inside; they are totally unlike cellular tissue, and are evidently not formed out of it, but actually constitute an essential part of the parasite;[†] but whether the worm ever leaves this cyst or not, and in what way it derives its nourishment through it, are matters entirely unknown as yet to naturalists.

The connexion of the cysts with the surrounding cellular tissue was this: They adhered strongly by the extremity, where the dark opaque spot is, at all other parts more loosely, particularly at the opposite extremity.[‡]

It is quite possible that the worm may at some period of its development abandon the cyst; in which case it would pass into the cellular tissue, and be lost to observation amongst its juices, for, being microscopic, it would be extremely difficult of detection in its new situation. The texture of the cyst is firm, elastic, crisp, and somewhat opaque throughout, but most so towards one extremity. The real structure of this extremity has not yet been made out. The cyst is easily lacerated with a needle, and from it the worm escapes by a little pressure; the worm does not seem connected with it in any way, but lies coiled or rolled up in a spiral manner, so as to occupy the smallest possible space. This circumstance of being rolled up is common to other parasitical entozoa, which have not cysts, such as the entozoa of a similar shape, but infinitely larger, infesting all the textures of the *Clupea*, and likewise that more remarkable parasite found beneath the intestinal mucous membrane of the horse, and which I shall describe more carefully towards the close of these observations.

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[*] "Cysts of an elliptical figure, with the extremities in general attenuated." Owen, Medical Gazette, December 26th 1835.

[†] "The cyst is adventitious, foreign to the entozoa, and composed of the cellular substance of the body infested, morbidly altered by the irritation of the worm." Owen, p. 477.

[‡] "The cysts are found to adhere to the surrounding cellular substance by the whole of their external substance, somewhat laxly at their more dilated part, but more strongly by means of their elongated extremities." Owen, p. 473.

The worm.—By rupturing the cyst there escapes a small worm, cylindrical and filiform, obtuse at one extremity, and pointed at the other;[*] much resembling the *Vibrio tritici*, as represented by Mr Bauer in the Philosophical Transactions. It seems to live many days, and even weeks after the death of the person whose muscles it infests, and lives for a short time when removed from the cyst, gradually unfolding itself.[†] When crushed with a needle it is seen to be tubular, the contents of the tube differing from the outer case, and resembling a series of globules connected together by a central filament. But under a higher microscope, and when examined unbroken, the worm has a very different appearance. As under the same glass, and in equally favourable circumstances, the worm has presented to me very different appearances, I may be permitted to conjecture, that these differences are constant, and are perhaps referable to sexual differences. First, in some there is an appearance of a central or digestive tube, with numerous contractions like *cæca*, as has been very carefully delineated by Dr Farre; the same appearance presented itself to my brother and myself.[‡] Or, secondly, the whole centre of the animal is observed filled with small globules. But it is quite possible that this second appearance may be merely the first structure not sufficiently made out. The head is rounded, and there is an evident appearance of a linear mouth or slit. The tail points rapidly, diminishing, and generally showing nothing of the darker central parts occupying the body of the worm higher up, whatever these may be ultimately determined to be.[‖]

Position of the Parasite in the Body.—I have already adverted to the singular circumstance of these entozoa being found in the cellular tissue of the voluntary muscles only; but amongst them we must include some muscles not strictly voluntary, such as the diaphragm, intercostals, *levatores ani*, and constrictors of the pharynx. They were found in the lower margin of the inferior constrictor of the pharynx whilst the muscular fibres of the gullet below them were entirely exempt from their presence. The same remark was made as to the fibres of the *levator ani*, and muscular tunic of the rectum.[*]

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[*] Mr Owen says, "obtuse at both extremities," but he must mean comparatively.

[†] In respect to this I do not speak with certainty.

[‡] In justice to Dr Farre's excellent paper on this entozoon, it is right to say, that my brother, in whose practical knowledge of the use of the microscope I have every confidence, leans entirely to Dr Farre's views in regard to the structure of the digestive tube.

[‖] We have never seen two worms enclosed in one case; but we have thought that some are rather smaller than others.

Pathological Effects.—When first discovered in human bodies, these worms were supposed to be the result of, or the cause of muscular debility; and conjectures of this kind were thrown out at the meeting of the British Association in Dublin, in 1835. These conjectures have been completely disproved.

. *The Natural History of the Worm.*—A good account of the natural history of this curious parasite is extremely desirable, but the following considerations will show, that as yet scarcely any data of consequence have been collected.

1st, Its anatomical structure, has not been clearly determined.

2d, It is not yet known whether or not it ever leaves its cyst.

3d, The causes giving rise to it, and its mode of reproduction, are altogether unknown. As a mere conjecture, I venture to suggest that it is gemmiparous, and the granular-looking structure of the outer cyst may be the organs or mode of its reproduction.

4th, Even its proper position in the scale of animal being cannot be determined. An animal resembling one of the *Filariæ*, but living enclosed in a cyst, and as yet found only within it, and that cyst forming seemingly an essential and constituent part of the animal, is an anomaly even in this most anomalous class of all living beings.

I have only further to add, that on finding my first observations differ so much from contemporary observers, I have repeated them with every possible attention to accuracy, using glasses of very various powers (amongst others the Wollaston doublet) and modifying the light as much as possible, but have constantly arrived at the same results.

II. *Of certain Entozoa found beneath the intestinal mucous membrane of the Horse.*

On two occasions my friend Mr Dick has sent me portions of the large intestines of a horse presenting the following very singular appearances. The gut being simply laid open so as to exhibit the mucous membrane, a number of dark spots are observed, evidently exterior to the inner membrane, and seemingly imbedded in the cellular tissue. On examining these dark points with a glass of very moderate powers, they are found to be parasitical worms, rolled up in a spiral manner, very similar to the peculiar human Entozoa, described in part 1st of this memoir, but much larger. *They have no cysts*,[†] and vary from the 10th of an inch to a length of at least $\frac{7}{10}$. They have a digestive tube divided into numerous compartments or sacculated; a mouth unarmed. The appearance which may have led naturalists to suppose the head *armed*, seems to me merely a rudimentary nervous system; viz. a cephalic ganglion, collar, and two nervous filaments proceeding from these. Along with the specimens, Mr Dick had the kindness to furnish me with the following interesting particulars. "I have found these worms, (Mr Dick remarks,) in several horses, and at different stages of their growth, from the size of a pin point, to that of an inch and a-half in length, and in two instances, in the blood-vessels. They seem almost always to produce a bad form of diarrhœa, and seem to depend on the food or situation in which the animal has been previously kept."

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[*] Mr Owen (or Dr Farre) mentions their being found amongst the muscular fibres of the gullet, but, I should think there must be some oversight in the remark.

[†] I insist on this fact the more particularly, as it shows that the presence of an irritant in the living texture does not necessarily produce a cyst. The cysts enclosing the human entozoon are not formed out of the surrounding cellular tissue as some have supposed,

"The horses I have found affected with these, have always been running out previous to their becoming ill."

These remarks by Mr Dick, remind me strongly of what I observed at the Cape many years ago. On the north-eastern frontier of that colony, horses are generally turned out to pasture throughout the whole year; they run, as the phrase is, night and day, and indeed are seldom or ever under a covered stable. During the winter months, in consequence of the almost annual droughts, the pasture is very scanty, and at times thousands of horned cattle, and a proportionate number of horses, die of absolute want, the improvident farmer having nothing in store for them. The horses are at this time much infested with intestinal worms, which leave them spontaneously with the first showers of spring, these giving rise to a most luxuriant growth of herbage in an incredibly short space of time, and covering with the richest pasture, in a very few days, a vast range of country, over which a single blade of fresh grass could not a few days previous be discovered.

It was in the same colony that I observed the tape-worm, infesting the human body to an extent altogether inexplicable. The official facts have been recorded in the seventeenth volume (p. 384) of this Journal. Somewhat more than 2000 healthy men, mostly in the prime of life, were marched into Caffraria; they were undeniably the healthiest body of men I have ever seen. There was not a single person on the sick list. In two months thereafter, they became affected with tape-worm in the ratio of nearly 30 per cent. The disease attacked officers and men. As the climate was excellent, no assignable cause for this extraordinary endemic ever occurred to me, excepting the fact of their food consisting solely, during the greater part of the campaign, of bad bread and of still worse beef; the flesh of over-driven, starved cattle, and of a quality rejected even by the naked savages, the Caffres.

Thus it seems to me that unwholesome food may give rise to the generation of entozoa; but in what mode must be left I apprehend for future observers to discover.

Explanation of PLATE III.

Fig. 1. Natural size of the cyst.

2. Magnified view of cyst. *a*, extremity by which it adheres to the muscles, and slightly drawn out in consequence of this adhesion, which appearance disappears when the cyst has floated in water for a short time.

3. Magnified view of the cyst after the worm has been *successfully* turned out. *b*, the worm as seen through a lens of an inch and a-half focus.

4. Cyst greatly magnified after having floated in water for half an hour, when the prolonged extremity disappears.

5. Cyst partially broken up. *c*, the central part inclosing the worm remaining entire; an appearance frequently presented by those which had lain in alcohol for any length of time.

6. Greatly magnified view of worm when first turned out of cyst, assuming invariably (if allowed to float in water) the form seen in figure.

7. Expanded form of the worm.

8. A. Natural size of one of the intestinal worms, observed by Mr Dick, under the mucous membrane of the intestines of the horse: they vary, however, very much in this respect.

9. Magnified view.

These drawings were made from specimens sent me by Mr Dick on the 24th February 1835.

Fig. 10 and 11 Represent a similar worm, of which specimens were sent me in March 1836. It is worthy of notice, that both occurred about the same season of the year, when the pasture is in its worst condition.

12. View of the head and mouth, seen under a high magnifying power, with the appearance which some have considered as an armed head, but which, both from inspection and analogy, we deem the commencement of the nervous system. (See above, p. 93, line 3d.)

ART. VII.—*Cases* by WILLIAM HENDERSON, M. D., Corstorphine.

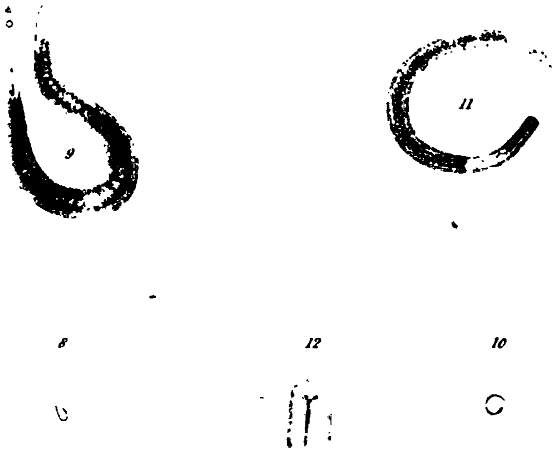
1. *Case of Softening of the Coats of the Stomach.*—MRS B. aged 55, had suffered from symptoms of liver-disease, frequently jaundice, for the last six years. About the beginning of the year her ailments assumed an aggravated form—constant nau-

PLATE III.

Edin.r Med. & Surg. Jour. NEWLY DISCOVERED ENTOZOA. Vol. XLVI. page 94.

HUMAN ENTOZOON.

ENTOZOON FROM THE HORSE.



sea, sickness, burning thirst, and obstinate vomiting, continued frequently for days, once for nearly three weeks. Substances swallowed no sooner reached the cardiac orifice, than they were rejected by a convulsive effort, over which she had no control. A few days before death, she retained a considerable quantity of port wine. The abdomen was flaccid; the bowels were obstinately constipated, and the urine high-coloured.

Inspection forty hours after death.—The liver was considerably enlarged, and of a yellowish gray-colour. The gall-bladder was small, contained a little healthy bile, and a calculus about the size of a small walnut, which after being washed and dried, weighed seventy-five grains, partly covered with a black coating, which cracked on drying and partially fell off, the other parts studded over with small eminences of a rosy or flesh colour. It contained also a quantity of the black coating in granular irregular masses, the largest of which weighed perhaps about twelve grains, soft, and easily crushed between the fingers.

The glands about the cardiac orifice of the stomach were enlarged, and filled with white curdy matter. The stomach was large, contained about three pints of a dark gray fluid, similar to a solution of lamp-black, and emitting a vinous odour. The villous coat of the cardiac orifice was completely corroded, having irregular ragged edges in the œsophagus and stomach; shreds only of the muscular coat remained. The external tunic had several large holes into some of which I could insert a finger. The contents of the stomach were prevented from escaping by thickened cellular membrane.

The kidneys were very soft, of a granular appearance, and a light colour; when cut up, a quantity of oily fluid dropt from them; some of the *papillæ* were imperfect, less acuminated, shrivelled-looking.

2. *Traumatic Tetanus ending fatally, with dissection of the injured part.*—Mrs L., aged 30, wife of a labourer, reports, that on the afternoon of Tuesday the 5th April, while breaking down some brushwood for fuel, the thumb of the right hand was pricked with a thorn, which shortly after produced considerable uneasiness; but on careful examination she could discover no portion of the thorn in the wound, and believed that none remained behind. The thumb swelled considerably, the swelling extending up the arm. On the Saturday following suppuration having taken place in the thumb, the swelling gradually abated; and the pain ceased. On Friday the following week, April 15th, she felt stiffness in the jaws, with difficulty in opening the mouth, even to the smallest extent; she complained also of general soreness all over, which she attributed to a recent cold.

When I first saw her on the 15th, I pinched and examined the thumb carefully, without producing pain or discovering any thing wrong; the wound was healed, except a small opening over the sheath of the extensor tendon; and all swelling was gone. During the night of the 15th, the tenth day from the receipt of the injury, spasms came on which continued till death terminated her sufferings on the evening of the 20th. The spasms were confined to the diaphragm, darting through from the stomach to the spine, with very little interval betwixt them. There was also slight opisthotonos, with painful rigidity of the posterior muscles of the neck. The spasms were alleviated by half drachm doses of the *Sol. mur. Morph.* given every hour. She managed to get down liquids, though with difficulty, till the night preceding her death, when the muscles of deglutition refused their office. From that time she sank rapidly.

I saw her shortly after death had taken place, and dissected the thumb. On laying open the sheath, there was exposed the the point of a thorn half an inch in length, lying under the tendon, over the middle of the first bone of the thumb in an oblique direction, the point slanting downwards and forwards, in contact with the nerve on the ulnar side of the thumb, the top or thick end slightly touching the nerve on the radial side. The nerve on the ulnar side extending upwards from the point of the thorn for rather more than half an inch, was double its usual thickness, and had a slight blush of redness where it was in contact with the point of the thorn. The cellular membrane around the part was slightly injected. I could perceive no change in the nerve on the radial side.

3. *Case of Epilepsy permanently cured by profuse Epistaxis.*—J. M., aged 8, a fine stout active boy, in January 1834, was seized with epileptic fits, not violent, but of frequent recurrence. The fit was usually preceded with blindness; and generally he could give warning of its approach. About December the fits became milder in character, and he often had only the precursor symptoms without the fit. Epilepsy produced a remarkable change in this boy's disposition. From being gentle and obliging, he became the very reverse, fighting and quarrelling continually with his companions. Coaxing, threats, or punishments were alike unavailing, producing nothing more than a momentary effect. The brow of the precipice, the house top, or mounted aloft on the branches of a tree were his usual positions, from which nothing could deter him.

In the spring of 1835, he caught hooping-cough, which fearfully aggravated his former disease, every strong fit of coughing bringing on one of epilepsy. He now was confined to bed, struggling night and day with the violence of the two diseases, and in the intervals was nearly fatuous. After the disease had lasted some time, a severe attack of coughing, ending in a profuse bleeding at the nose, completely carried along with it his epileptic fits, which from that moment never recurred, and he rapidly regained health and sanity. At Martinmas last, his family removed to Glasgow. I have heard of him since, and know that he still continues well.

It is of no use to detail the treatment, as nothing proved beneficial.

Corstorphine, 25th April 1836.

ART. VIII.—*Cases of Shortening of the Neck of the Thigh-Bone, with Remarks.* By GEORGE GULLIVER, Member of the Royal College of Surgeons, Assistant-Surgeon to the Forces. Communicated by Sir James M'Grigor, Bart. Director-General of the Army Medical Department.

SINCE the publication of Sir Astley Cooper's work on fractures, the profession have become familiar with the changes incident to the neck of the thigh-bone in old subjects. But, notwithstanding the memoir of Mr Benjamin Bell, and the more recent observations of Mr Liston and others, there is yet some uncertainty how far insterstitial absorption and shortening of this part may be the effect of disease at an earlier period of life.

The examples of shortening of the neck of the thigh bone preserved in our collections, have been generally found in the dissecting-room, from which they have sometimes been produced as instances of reunion of fractures within the joint, and still more frequently attributed to the natural effect of old age. Morgagni expresses a doubt whether he was not deceived in the two cases described by him. Those of Sandifort and Dr Knox were probably original malformations; and of the few examples supposed to have occurred in middle-aged subjects, we have either an inconclusive history, or the case, as described in the living body, has not been completed by an account of the appearances disclosed by dissection after death.

Hence the disease has hardly found a place in the systematic works of pathology, and we require instances of which the history is unequivocal. Of those which I present, one appears to be of this nature, and in connection with this, the others may perhaps not be considered as entirely devoid of interest.

CASE. I. A country boy, aged 15, of healthy appearance, but weak intellect, was brought to me for advice under the following circumstances. About nine weeks before, he had received an injury to the right hip by a fall into a gravel pit, in consequence of which he complained of much pain about the joint, but continued his work without intermission for a month after the accident, when he became so lame that he was obliged to desist. The pain gradually diminished, but the lameness remained; and in this state he was accustomed to wander about his home up to the period of his visit to me, on which occasion he walked at least a mile.

I had him stript, and made him pace up and down the room as in the examination of a recruit, when I observed, that he inclined his body a little forwards and to the affected side. He limped, but apparently more from diminution of length in the affected limb, than pain; for he planted the foot firmly, and could support the weight of his body on it with but slight uneasiness. There was considerable abduction of the member; it was somewhat everted, and presented a little in front of the other, and the thigh and buttock were rather diminished in cicumference. When put on his back, and the bones of the *pelvis* placed exactly opposite, and the extremities parallel to each other, it was plain that the affected limb was at least half an inch shorter than the other, which was verified by comparative measurement between the upper anterior processes of the haunch bones and the *malleoli*. The distance between the centre of the *pubis* and the summit of the great trochanter was also found to be lessened, and a similar diminution appeared between the latter part and the commissure of the nates. No disease could be detected in the coxo-femoral articulation; its motions were easy and natural, and when its surfaces were brought into contact by striking the trochanter or pushing up the limb, he complained but little, and not at all when firm pressure was made on the trochanter while the thigh was freely moved, although he experienced considerable pain when forcible extension was practised.

Some months after this description was drawn up, I again saw this boy, when the limb had become considerably shorter, and the lameness had consequently increased. His mother informed me that he had suffered more or less from nocturnal pains about the joint and thigh ever since the receipt of the injury; but his general health is not impaired, and he continues to loiter about the village, although incapable of work or much exercise.

Case II. Edward M'Guth, aged 45, a man whose constitution had been somewhat debilitated by service in India, received a contusion on the right hip by a fall down the hatchway of the ship on his passage home. I saw him nineteen days after the accident, when there was much inflammation, swelling, and discoloration of the soft parts around the seat of injury; the position of the limb was natural; he was unable to walk, but could stand on it, although the effort was painful, as was also that of bending the thigh on the *pelvis*, which, however, he could perform slowly without assistance. When the limb was rotated he also complained of pain, but the arch described by the great trochanter was similar to that of the sound limb, and no fracture was perceptible, or indeed the ordinary symptoms of such an injury. The case was therefore regarded as a simple contusion,—an opinion in accordance with that of the medical man who saw the patient at the time the accident occurred. M'Guth informed me, that he managed to get up and support himself on his legs immediately after the fall; but the pain was so great that he was immediately taken to his bed, where he remained till I saw him immediately after his disembarkation.

On the thirty-first day from the receipt of the hurt he was out of bed, and walked across the room with the assistance of a stick; and in three weeks more he was walking about the hospital with tolerable ease.

Previous to his dismissal it was observed that the injured limb was shorter than natural, and on measurement, as in the first case, the shortening was found to amount to about half an inch. There was also marked diminution in the extent between the *pubis* and trochanter of the affected side.

Case III. John M'Grath, aged 30, 2d Battalion Rifle Brigade, was admitted into regimental hospital at Malta on the 30th June 1828, with a severe contusion of the right hip, from a fall over a wall twelve feet high, when drunk. No symptoms of fracture presented. He was discharged on the 7th of August following with very slight lameness, but continued to do the active duty required by his regiment, although he occasionally complained of weakness in the injured part. There was manifest protuberance of the right hip, and appearance of shortening of the limb, with an awkwardness in marching. On the 1st August 1830, he committed suicide.

On examination of the body, the neck of the thigh-bone appeared somewhat shortened, and forming nearly a right angle with its shaft, the upper part of the head being just level with the summit of the great trochanter. There was some adventitious bony matter near the trochanter at the basis of the neck, and an increase of density and thickness of the upper part of the shaft. The capsule of the joint appeared uninjured; but the round ligament had apparently been detached from the head of the bone, to which it had acquired a new connection near to its original site.

I am indebted to the kindness of Dr Davy for the account of the *post mortem* appearances observed in this case, which were noted down by him at the time, and for the abstract of its previous history, which he received from Dr Scott, Surgeon of the regiment.

Case IV. J. Fox, aged 32, after a service of eight years in the West Indies, died of *phthisis*, for which disease he had been two years under treatment in hospital. A long time after his confinement it was observed that his right inferior extremity was emaciated, but there was no note of any affection of the limb previous to his admission into hospital.

At the *post mortem* examination, the right inferior extremity was found, by measurement as in the preceding cases, to be at least an inch and a-half shorter than the other, and the extent between the *pubis* and trochanter of the affected side was diminished in a corresponding manner. The limb was much emaciated, but its position was natural, and the motions of the coxo-femoral articulation were not impaired.

Having removed the upper part of the *femur*, I found its neck absent. The head was flattened and expanded considerably; it was approximated to the shaft so as to be situated much below the great trochanter. A section of the part was made, when the upper and lower shell of what remained of the neck, was seen to be formed of compact bone, quite equal to the ordinary thickness in this situation, and the reticular texture of the bone was more dense for some distance from the edges, so as to form an indistinct line on either side of the most contracted part towards the centre. The *cancelli* were filled with caseous matter, in some places nearly colourless, in others tinged with dark grumous blood. The acetabulum was diminished in depth, but enlarged laterally, so as to correspond with the altered shape of the head of the thigh-bone. The cartilage of the articulation presented throughout its usual thickness and consistency, and was generally smooth and lubricated with synovia. I examined the other thigh-bone, and found its form and condition in every respect natural.

I now sought information respecting the history of the case from some of Fox's comrades who had served and come home with him. From them it appeared, that Fox had received a fall about three years before at the island of Nevis, in consequence of which he often complained of pain about the hip, but continued to do his military duty many months after, never having been confined on account of the accident.

The morbid parts described in this and the preceding case, are preserved in the museum of the Army Medical Department, to which the profession have free access through the liberal arrangements of the Director-General.

The case of Fox appears to afford a well-marked instance of gradual removal of the neck of the thigh-bone in consequence of action induced in that part by injury. From the history of the case it is impossible to suppose that fracture had occurred; and it is improbable that any considerable shortening had taken place previous to his admission into hospital for the thoracic affection, since he performed the duties of a soldier long after the accident, without any lameness apparent to his comrades. We are, therefore, constrained to suppose, that the removal of the neck of the bone had been effected during his very long confinement in hospital for the pectoral disease,—a circumstance not very favourable to the recommendation by Dr Hawkins of the horizontal posture as a remedy in such cases, and equally adverse to the opinion of those continental pathologists, who attribute this alteration in the neck of the thigh-bone to the gradual operation of the superincumbent weight of the body. But Dr Knox has long since remarked, that it is unnecessary to have recourse to such an explanation of the cause of interstitial absorption of bone; and in the museum at Chatham this phenomenon is exhibited in the spine of a young man, in which the change took place in the recumbent posture.

The case observed by Dr Davy is not without its value in connection with the history. But he is aware that it is difficult to deduce a conclusion from an apparent alteration in the extent and direction of the neck of the *femur*, without an opportunity of comparison with that of the corresponding limb. In a recent dislocation of the hip-joint of a young soldier, which I dissected some years ago with Sir George Ballingall, the neck of the thigh-bone appeared more horizontal than usual.

I intended to have described various preparations illustrative of the subject of this paper; but the observations of Mr B. Bell and Mr Liston render this unnecessary. Besides, a somewhat familiar acquaintance with some of the anatomical collections of this country, induces me to believe, that specimens equally explicit with that of Fox must be very rare, if we have any of which the history is unexceptionable; and it is not to be supposed that the profession will attach much importance to examples described in the living body, without the complete elucidation of the case by dissection.

For this reason it is needless to enter at length into an examination of the two first cases described in this paper. But I may observe, that if the case of M'Guth be considered one of fracture of the neck of the bone, that of the boy was certainly not so. And if it should be said, that the latter was an example of disease of the hip-joint, it can hardly be supposed that the shortening of the limb has been the effect of the usual process of destruction of the head of the bone by ulceration, since such a change would be incompatible with the mobility of the joint, the impunity with which the surfaces are pressed and moved on each other,—the absence of disease of the neighbouring soft parts, and of constitutional derangement.

There seems to be a disposition in some parts of the body to take on an action in consequence of disease or injury, which brings them to a condition, which, at a more advanced period of life is rather a physiological than a pathological phenomenon. What is premature old age, from the exhausting effects of disease, but a general fact, of which the affection described in the neck of the *femur* is perhaps a particular illustration?

But I would venture to suggest, that those who have an opportunity should examine the state of this part in relation to the later periods of life, so as to enable us to distinguish between what has been considered as connatural with old age, and that which may be regarded as the effect of disease.

Chatham Barracks, 1836.

Art. IX.—*Abstract of cases in which Pseudo-membranous Substances have been discharged from the Bowels.* By William Thomson, M. D., Fellow of the Royal Colleges of Physicians and Surgeons.

At the conclusion of a recent communication relative to the discharge, by stool, of portions of the entire cylinder of the intestinal tube, (No. 127.) I suggested that there are two sources of fallacy to which we are exposed in admitting individual cases to be of this nature. In the *first* place, the substance discharged may,—if we may trust to the statements of authors on this point,—consist merely of the lining membrane of a portion of intestine, detached, by some morbid process, from the rest of its coats; or, in the *second* place, the substance discharged may have formed no part of the texture of the bowel, but be merely an adventitious exudation from its internal surface, similar to that which is formed on the mucous membrane of the larynx and trachea in croup, and which is occasionally expelled from that situation in the efforts of vomiting or of coughing; or to that which is liable to be formed on the surface of the upper part of the alimentary canal, in consequence of aphthous affection, constituting the disease which, as occurring in new-born children, has been termed Muguet by the French. To this pellicular form of exudation on the surface of mucous membranes, it has recently, as is well known, been proposed to apply the general designation of Diphtheritis.

I confess, I am disposed to entertain doubts, whether there be any morbid process, by which we can suppose the mucous membrane of the intestinal tube to be detached from its other coats, in portions of considerable size, and at the same time of sufficient consistence to retain its membranous character. This, however, is a point to which I shall afterwards advert. At present I may remark, that if the detached lining membrane of a portion of the bowel, or an adventitious layer of coagulable lymph, may be supposed liable, in being discharged by stool, to be mistaken for portions of the entire bowel, it must be still more difficult to distinguish these two kinds of substance from one another; and, accordingly, in perusing the cases that have been put upon record, as examples of one or other of these occurrences, it will be found, that the grounds on which the character of the discharged substances has been determined, are far from having been in all instances satisfactory.

In the present communication, it is my object to bring together a series of cases in which portions of albuminous matter have been discharged from the bowels, with the view of endeavouring to elucidate the particular circumstances under which an exudation of this kind is liable to be produced on the mucous membrane of the alimentary canal. The substance discharged by stool may exhibit considerable diversity of appearances. Not only may it occur in the form of layers more or less tubular, so as to lead to the notion of its being the inner coat of the bowels that has become detached and been evacuated, but sometimes it exhibits appearances that have led to its being mistaken for portions of dead tape-worm, and sometimes it assumes more or less of a globular form, so as to suggest a comparison of it to a clue of cotton wick.

It will, I think, be found convenient to arrange the cases in which a discharge of this nature has occurred, under three heads. Under the *first*, will be comprehended those cases in which one or more portions of albuminous matter have been passed by stool upon a single occasion, without there having appeared to be any recurrence of this discharge. Under the *second*, will be included those cases in which a discharge of this kind has continued a few weeks, and then finally ceased; and under the *third*, those in which the discharge has recurred from time to time during a long series of years. It has been the occurrence in my Father's practice, of a considerable number of cases of this last description, that has particularly called my attention to this form of alvine evacuation.[*]

It is obviously in cases of the first class chiefly, those namely in which the discharge occurs only on one single occasion, that doubts may arise as to whether the substance be a portion of the bowel itself, or a secretion from its lining membrane.

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[*] In collecting the materials of the following communication, I have enjoyed an advantage similar to that which I had occasion to mention in my paper on the discharge of portions of bowel; that, namely, of having had the ground previously gone over in an inaugural dissertation, published at Tubingen under the presidency of my friend Dr H. Authenrieth. Vide, Inaug. Dis. Med. de Pseudangomorphosi in Tubo Intestinali quam, &c. submittit Mattheus Uhl. Tubingæ, Septembris 1831.

It does not appear, that the formation of an albuminous exudation on the mucous membrane of the alimentary canal, necessarily indicates a very high degree of inflammatory action; nor is there anything in its particular seat which renders it, as in the case of croup, a source of considerable danger to the patient. Hence it is, that comparatively few *post mortem* examinations have been recorded in cases of this kind. Those which I have been able to find I have placed together under a separate head, without reference to the particular characters which they exhibited.

A very important feature of distinction between the different cases that are to be detailed, will be found to be, that in some the discharge of pseudo-membranous substances was preceded or accompanied by discharges of blood, in greater or less quantity; in some by discharges of purulent matter, and in some by both bloody and purulent discharges, whilst in other cases, neither pus nor blood have appeared in the evacuations. Are we entitled to infer that in the latter cases the mucous membrane was entire, and that in the former it was abraded or ulcerated?

SERIES I. CASES in which Pseudo-membranous substances have been discharged from the bowels, on a single occasion.

1. Bianchardus de Triplici Intestinorum polypo, quorum longiorem nonnulli hactenus unicum vermem crediderunt. Lancisii Opera, Tom. ii. p. 33.
2. Dr Percival, Miscellaneous Communications: Mem. Med. Society of London, ii. 60, (1789.)
3. Valentinus, Observatio admiranda de ejectione membranarum sanguinolentarum per secessum formam viperæ referentium. Venet. 1621. Referred to by Haller in his Bibl. Medic. Pract. ii. 497.
4. Heurnii Vita ad edit. Oper. Omnium prefix. Lugd. Bat. 1658.
5. Fernelius, Pathologiæ Lib. vi. cap. ix. Intestinorum morbi, causæ et signa.
6. J. J. Treyling, Vagina Enteromorpha, per anum excreta. Acta Phys. Med. Nat. Cur. v. 436, obs. 126.
7. Molinelli Comm. Bonon. Scient. Acad. ii. p. 1. Medica, Obs. ii. p. 158.
8. M. Destrées. Journ. Gener. de Medecine, lxviii. 206.
9. Nic. Tulpius, Interior Intestini tunica, excreta—Observ. Med. Lib. iii. cap. xvii.
10. Morgagni, Epist. xxxi. Art. 19.
11. Apini de Abscessu Tunicæ Intestinalis Glandulosæ; Ephem. Med. Phys. German. Dec. iii. Ann. ix. et x. Obs. 179, p. 315.

12. Lecheverel, Medecin au Havre, Observation d'une inflammation suivie de l'exfoliation des gros intestins. Journ. Gener. de Medec. Chir. et Pharm. xxix. 44, 1807.

Series II. Cases in which a pellicular discharge continued for several days or weeks, and then ceased.

13. J. M. Verdries de Pelliculis intestinali tunicæ similibus, Cent. i. obs. 19.
14. Godefr. Thomasius de interioris Intestinorum tunicæ ejectionibus, Ephem. Med. Phys. German. Dec. iii. An. iii. Obs. 190, p. 319.
15. D. C. Berthold Behrens de Membranis per anum excedentibus. Ibid. Dec. iii. Ann. v. et vi. Obs. 34, p. 77.
16. Joh. Maur. Hoffmannus de Diarrhœa cum excretione pellicularum plurimarum. Ibid. Dec. iii. Ann. ix. and x. Obs. 60, p. 124.
17 and 18. Kampf, Neue Methode die Krankheiten des Unterleibs zu heilen, Leipzig, 1786.
19 to 22. Dr Powell. On certain painful affections of the intestinal canal. Trans. Coll. Phys. Lond. vi.
23. Kampf, uti supra cit.
24. J. Gottl. Bauer. Epistola de Molis Intestinorum, Dresdæ, 1747. (V. Halleri. Disp. Med. Pract. iii. 463.)
25. Dr Mason Good, Study of Medicine, 1822. Diarrhœa Tubularis, i. 239.
26. Uhl, de Pseudangomorphosi, p. 16.

Series III. Cases in which the pellicular discharge has recurred from time to time, during a long series of years.

27. Dn. Lic. Rosinus Lentilius; Appendix ad An iii. Dec. iii. Ephem. Med. Phys. German. p. 88.
28. Dr Thomas Simson, Histories of the Separation of the Villous Coat of the Intestines in Diseases. Edin. Med. Ess. and Observ. v. pt. ii. p. 656.
29. Dr Monro. The Morbid Anatomy of the Human Gullet, &c. Edin. 1811, p. 120.
30. Hufeland's Journal, viii. ii.

Series IV. Cases of pseudo-membranous discharge in which an examination of the body has taken place subsequently to death.

31. Dr Abercrombie on the Diseases of the Stomach, &c. Edinburgh, 1828.
32 and 33. Gendrin, Histoire Anatomique des Inflammations, Paris, 1826, i. 631.

34. Tartra, Traité de l'Empoisonnement par l'Acide Nitrique. Paris, 1802.

35. Observation par M. Lefaucheux, &c. sur un sac membraneux faisant partie de l'estomac, rendu par le vomissement. Journal General de Médecine, &c. xxiii. 349. (1805.)

Series I.—Case I. A woman recently married, of slender form, and, from poverty, irregular in her mode of life, was seized with fever, and the whole of the fauces became covered with a white and tenacious crust. The fever was accompanied with pain in the side, descending to the region of the stomach, with difficult breathing, troublesome cough, and ultimately bloody sputum. She was treated on the supposition of her disease being pleurisy, but passed into such a state as to hold out little prospect of her recovery. While she was in this condition, however, the sour character of her breath led to a suspicion of the existence of worms, and vermifuge remedies having been administered, she passed by stool a white body, very long, compressed, and marked by what appeared to be numerous joints, along with some round lumbrici. After this evacuation, the pain, cough, and fever immediately subsided. Bianchardi himself was disposed to regard the substance discharged as a single, very long worm, but Lancisi and Morgagni on being consulted, expressed their conviction that it was not a worm, as not possessing any vital organs, but that it consisted of concrete juice formed in the intestines, in the same way, says Lancisi, as polypi are sometimes formed in the heart and arteries.

Case 2. Lady A. G. aged two years, had an aphthous fever, during which a few ascarides appeared in her stools. On this account, when sufficiently recovered, she took a dose of rhubarb and calomel, which occasioned the discharge of six or eight annular substances, resembling in figure portions of guts, but evidently unorganized. "I found them," says Dr Percival, "to be nothing more than gluten, secreted probably by some parts of the alimentary canal, affected, by the fever, with aphthous inflammation."

Case 3. The only information given by Haller respecting this case, is, that the discharge occurred subsequently to Empyema, and that the membranes evacuated were ten hand-breadths in length. The patient recovered. The author conjectured that the membranes consisted of blood effused from the vena portæ.

Case 4. The celebrated critic and scholar Lipsius, had long suffered under a very tedious complaint, in the course of which he experienced various febrile attacks, and his abdomen and whole body became flaccid and emaciated. One day being at stool, after having taken medicine, he felt that he was discharging a large quantity of continuous and coherent matter. On inspection he was surprised to find that he had discharged a mass having quite the form and character of the intestines. He immediately sent in a fright for his medical adviser Heurnius, declaring himself a dead man, as he had passed the whole of his bowels. Heurnius, however, on inspecting the dejection, congratulated him on having got rid of the cause of his complaint. For it was, says his biographer, a slow and viscid pituita, which, in consequence of his sedentary life, had collected by degrees in the whole intestinal tube, and had assumed its form. After the discharge of this substance, Lipsius recovered, and he ultimately regained his usual health.

Case 5. An ambassador of the Emperor Charles V. was affected with severe pain, and with a tumour stretching from the right hypochondrium, through the pit of the stomach, to the left hypochondrium. Every kind of remedy having been administered for a period of six years, with a view of softening the induration, at length, after the injection of a somewhat acrid glyster, a hard and firm body, tubular, and about a foot in length, was passed, which he feared to be a portion of intestine. But as he seemed suddenly relieved, two other clysters were administered, and a similar substance having been again brought away, he was immediately restored to his former state of health.

Case 6. A woman, aged 60, who had, for the space of five years, suffered from colicky pains, flatulent spasms, and constipation, felt from the fundament repeatedly, when at stool, some thickish substance projecting. Suspecting this to be a prolapsus ani, she several times replaced it, and in consequence of the difficulty of procuring an evacuation, she had thrice a clyster administered. By means of these, the preternatural membranous substance came more distinctly into view, and was at last discharged. On being examined, it was found to be a sheath, filled with excrement, resembling very much the colon, and, when it was cleaned of the feces it contained, and blown up, it was found to be 48 Parisian inches in length. The patient was relieved from the griping pains which she had previously suffered. On examining this membranous substance with the microscope, sometimes in a dry state, and sometimes softened with water, it was found, that though it resembled in figure the colon with its valvulæ conniventes, no blood-vessel or traces of fibres could be detected in it; it seemed to be nothing but a simple layer of a very thin and homogeneous substance, very like that which is produced by dissolved isinglass, spread upon polished marble or a plate of glass, and dried.

Case 7. A man who had suffered long and severely, first from griping pains, and afterwards from dysentery, was seized by a still more severe pain, with frequent desire to go to stool, but attended with a great degree of costiveness. He felt that there was something in the anus, which, notwithstanding his efforts to expel it, remained impacted in the passage, and prevented the feces from being discharged. He consulted a surgeon, who, on inspection of the affected part, declared it to be a case of prolapsus ani, and recommended, that in the first place, fomentations should be employed, and then the piece of gut should be returned, and that great care should be taken to prevent its falling out again. These measures produced no effect; there was no remission of the tenesmus or pain; and after suffering for a number of days, the patient himself, laying hold of the substance which was protruding from his anus, drew it out, with some difficulty, but without any pain. The substance was not unlike the fungous flesh of ulcers; it was more than a span in length; hollow, and open at the one extremity, but shut at the other. In its cavity, besides some blackish and dry feces, there were contained some calculi, not very numerous, resembling grains of wheat in size, figure, and colour. After the extraction of this substance, the patient, though not completely well, was better, for the tenesmus began to abate, the belly to be open, and the pains were diminished in severity.

Case 8. A man affected with intestinal inflammation and cystitis, passed by stool so large a portion of false membrane, that he was alarmed by it, believing that he was passing his bowels. This patient passed at the same time in his urine, with severe pain, thick mucus mixed with portions of membranous concretions.

The next three cases have usually been regarded as examples of the separation and discharge of portions of the lining membrane of the bowels.

Case 9. A man having suffered severely from sharp gripings in the bowels, passed, within eight days, the whole of the inner coat of the rectum. This was not expelled at once, because it adhered firmly to the fundament and could not be easily separated from it. The patient completely recovered.

Case 10. A Jew merchant 45 years of age, on the decline of a malignant fever, had been attacked with a very troublesome pain at the rectum, attended by a sense of weight and obstruction. At length, along with a discharge of blood, a thickish kind of membrane as it seemed, began to protrude from the anus. When Morgagni saw this substance hanging from that situation, it was about six fingers-breadth in length, and exceeded an inch in width; its colour was cineritious, degenerating into livid, like that of membranes which are affected with gangrene, yet it did not fall off, being continued within the intestine, and so far as the surgeon could ascertain, by examining very gently, connected to it. From the time of its exit, the pain became less severe, but blood continued to issue forth occasionally.

On the following days the membrane came away, being rather ruptured by the constriction of the sphincter, as it seemed, than of its whole length ; blood and an ill-conditioned ichor again issued out, and an alarming hiccough came on. A great quantity of pus was subsequently discharged, but Morgagni saw the patient out of bed in about five weeks, manifestly recovering his strength, colour, and habit of body, and retaining not only his feces, but also healing injections which were administered. There was some pain, indeed, even then, but it was evidently slighter, nor was it any longer very troublesome in its original situation. This patient recovered, and was alive and in good health after an interval of eighteen years.

Case 11. A man, aged 49, who had been long engaged in military service, was observed to be gradually losing his healthy appearance. At length he was attacked with the usual premonitory symptoms of acute continued fever ; he complained of very sharp pains shooting frequently through his right axilla, and causing his body to rise as if in an epileptic attack. His bowels were repeatedly moved, and he appeared better the following morning ; but though he breathed well, did not complain of pain either in the belly or in the chest, and was not troubled with cough, he began, after a slight hawking, to spit a viscid mucus tinged with blood, without any great degree of exertion and without any cough, as if it rose spontaneously into the mouth. This viscid mucus tinged with blood became at last mixed with pus, the cough became frequent and urgent, and on the morning of the 6th day a portion of membrane was discharged with the sputum, which swam in water. The bowels having been constipated for three days, and the patient feeling a degree of tension in the abdomen, an emollient clyster was administered, which produced a stool containing a quantity of pus and blood, or matter similar to that which had been discharged from the mouth. Soon after this, gripings came on, and another motion of the bowels took place. On examination, there were found among the excrements, substances of an exactly tubular form, that seemed to be entire intestinal coats. They were torn at each end, sprinkled over with pus and blood, and in some places marked with reddish specks as if made with a needle. They were of different lengths ; one portion being about a span. On more accurate inspection, says the author, it appeared that they were portions of the interior glandular membrane commonly called the Peristroma Villosum, for those rugæ and folds which are observable in the internal membrane of the alimentary canal could be very distinctly seen in them. The bowels were twice moved in the course of the night; the stools contained bloody and purulent matter, but no membranous substance; the pus and blood continued to be discharged for only two or three days longer, and the patient gradually recovered, so as to be only nineteen days in all under treatment.

In annexing the following case to this series, I confess I feel great difficulty in forming a conclusion as to the nature of the substances discharged.

Case 12. A lady, aged 67, had been subject for many years to constipation, to such a degree as to be sometimes ten days without a stool. When she had a call, it required painful exertions, and the consequence was the production of a prolapsus of the rectum to the extent of an inch. One evening, (19th Oct. 1806.) she felt some uneasiness and slight colic, which announced a stool. In the consequent efforts, vomiting came on, and the patient brought up a chamber-pot-full or more of fluid and bright red blood. After some indurated feculent matters had been discharged by stool, the blood came that way also, and the two kinds of discharge recurred several times during the night, always preceded and followed by acute gripings. When seen next morning her face was pale and sunk, the skin dry, and of a burning heat; the pulse contracted, frequent and unequal; the mouth dry; the tongue red; sharp pains were felt over the whole of the abdomen, and more particularly on the left side. Twelve stools and four vomitings occurred in the course of 24 hours. The blood was fluid and red, intermediate between venous and arterial.

The next day, all the symptoms had increased; they were accompanied with an extraordinary degree of meteorismus and of sensibility of the abdomen, and on the day following with frequent and painful hiccough. In consequence of the extension of the general inflammation of the intestinal tube to the œsophagus and throat, deglutition became difficult. A slight degree of smell now became perceptible in the stools, and some particles of purulent matter. On the 4th day, the symptoms were increased in severity; only one vomiting and eight stools occurred, which were rather brown than red; they were mixed with some flocculi of fecal matters and deposited at the bottom of the vessel a grayish pus. From this time a gradual improvement took place, so that between the 8th and 12th day, she was able to rise and walk about her room, though always bent, the pain in the abdomen not allowing her to straighten herself. She had from six to seven stools every 24 hours, which contained a large quantity of purulent matter.

On the 15th day of the attack, after an ordinary stool, feeling that something remained in the passages, she drew out from them a ribbon-like substance, which on being washed appeared to be a portion of intestine, formed by the exfoliation of a portion of the colon, and of the whole rectum, to the length of about two feet. At a subsequent stool, another portion of the same length as the first was passed. The author thought he could distinguish in it the three internal coats of the colon, several of its pouches or cells, fatty pelatons, and the kind of raphe or longitudinal line that is found below, and in the direction of the mesocolon. This portion was followed by two others, each three or four inches in length, but so torn that it was impossible to recognise either the form, or the coats of the intestines. From this time the patient gradually recovered, regaining her appetite and strength. Her bowels continued open, calling her frequently two or three times a day to stool. Sometimes the stools were rather liquid, in which case she required to be on her guard, as she was not at all times able to retain her evacuations. She remained thinner, and drier than before her illness, though she had still her colour and natural gaiety. After the end of November, she did not experience any actual pains in the belly; her body regained its natural erectness; but the abdomen continued more sensible to the touch, and had, she said, a feeling of being less full than usual. She required to walk with caution, in order to avoid the disagreeable succussion which she experienced from the shock of a hard body or of a false step.

Series II.—Case 13. A man, about 50, was rather severely affected with bilious fever, during the progress of which he suffered most excruciating griping pains. These symptoms, in a short time, diminished in severity, but the patient was suddenly attacked with jaundice. Being put on the use of a laxative medicine, he passed substances which he supposed to be entire portions of bowels, but when these were washed in water, and examined, they proved to be nothing but pellicles of concrete mucus that had assumed the figure of the containing bowel. A large quantity of mucus, in the form of tubes and pellicles, having been discharged in this way for several days, he at length recovered, and continued free from frequent attacks of indisposition with which he had been previously troubled.

Case 14. A woman who had experienced various ailments in consequence of the use of a poor and unhealthful diet, suffered particularly from obstinate constipation of the bowels, which in no slight degree aggravated her other ailments. From the use of some pills, she had frequent purging, and, after this had terminated, she suffered, day and night, most excruciating gripings, with lancinating pains in the bowels, particularly about the umbilical region, and a sense of heat and most intense burning. From the treatment pursued, partial relief only was obtained. After an interval of some weeks, she passed by stool, not without pain, some membranes variously convoluted, immersed, as it were, in a very tenacious glue, and resembling partly intestines broken down into small fragments, and partly a thicker and more extended pellicle. Two portions of fibrous and thick pellicles examined by the narrator, were more than five inches in length, two inches in breadth, and of a blackish colour at their extremities. The woman seemed to improve from day to day, till the membranous dejections, having gradually diminished, and the griping and lancinating pains having ceased, she was restored to her former state of health,—and at the time of her case being published, she had not experienced any return of her illness.

Case 15. A young woman, after suffering for eight days from diarrhœa, found something hanging down from the anus, which, as often as it was replaced with the fingers, always burst out again. It was half a span in length, not unlike a finger in thickness and roundness, but, in respect of dryness and hardness, resembled a stick, and was of a black-colour. At last, when it could not be replaced, it dropped suddenly into the close-stool. She then passed some dry membranous fragments of the breadth of a finger, but several fingers breadth in length, every second or third day, with pain in the back and belly, particularly about the hypogastrium and umbilicus, in which region she at the same time experienced a feeling of constriction. After some days, a fresh mass of the same substance appeared, and it was then that she was visited by the narrator. These membranes could not, he says, be considered as the internal coat of the intestines, since that membrane could scarcely have been discharged, without being preceded by a flow of blood or of pus, which was not observed in this case, and the membranes themselves were harder and firmer than to be taken for the inner coat of the intestines. The patient recovered.

Case 16. A matron of rank, who had very frequently suffered from wandering gouty pains, and other similar symptoms, at last experienced frequent diarrhœa, in the course of which, besides fluid excrements, sometimes of a yellowish and sometimes of a greenish colour, and sometimes of a pale muco-serous appearance, she passed, at longer or shorter intervals, an enormous quantity of pellicles. Of the coming of these she was warned by the tensive pain, and the motion, as it were, of boiling water, under the left hypochondrium, which she experienced. Various opinions were formed respecting these pellicles, some believing them to be portions of tape-worm, though no symptoms of tape-worm had occurred; others supposing them to be portions of the internal villous coat of the intestine, or vasculo-glandular tunic, separated by ulceration. But the narrator, having washed the pellicles well in water, and examined their form, concluded that they consisted of a viscid mucus which had coagulated over the valvulæ conniventes of the ileum, and particularly in the colon, and had condensed into a species of membranes. After the use of purgatives and detergent clysters, the excretion of pellicles was gradually diminished, and at length entirely ceased.

Case 17. A woman, in other respects healthy, but who had made but a bad recovery after child-bearing, became affected with feverish paroxysms, sometimes assuming a simple, and at other times a double tertian type, accompanied with obstinate cutaneous eruptions, and with difficulty of swallowing, which daily increased. At the end of four weeks, the patient, whose countenance had assumed a dark-yellow hue, complained of such severe pains in the fauces, that she had the greatest difficulty in swallowing fluids. But nothing unusual could be discovered either externally to, or within the fauces. The tongue was clean, but dry; there was want of taste and of appetite; the belly was bound, the pulse languid, but more frequent than usual. A clyster having been administered, a mucus resembling frogs spawn was passed, and in consequence of the internal use of tartar emetic, vomiting of black bile was excited. After much bile and mucus had been discharged by stool, the difficulty of swallowing gradually abated. The pains in the fauces, head, and joints, subsequently disappeared. But under an attack of fever, the difficulty of swallowing returned, though by the employment of clysters an incredible quantity of tenacious mucus was discharged, part of which was of a tubular form like intestines. In ten weeeks after the commencement of the illness, the patient had regained tolerably good health.

Case 18. An engraver who, besides leading a sedentary life, was immoderate in respect of diet, was attacked with most obstinate constipation, after having for several weeks suffered from pains in his feet, a sense of weight in all his limbs, diminished appetite and increased thirst. The constipation was accompanied with pains in the abdomen and back; and the belly, in which the pains were most severe, was swollen and tense, and could not bear the slightest touch. The tongue was dry, and yellowish towards the root; the pulse full, quickened, and harder than natural. The patient was perpetually harassed with thirst and vomiting, so as frequently to throw up his medicines and drink. Clysters and laxatives having been administered, along with fomentations, the pains and vomiting ceased, but it was not till the tenth day that the bowels were moved. Eight days afterwards, the pains in the joints, gripings and constipation returned, and continued for five or six days. The clysters now brought away large portions of mucus, which were partly shining and glassy, partly resembled pipes, with parietes of the thickness of a straw—which persons unacquainted with the appearance, supposed to be portions of intestines,—and partly solid fleshy masses. By this discharge the patient was wonderfully improved in his health.

Cases 19 to 22. Dr Powell, after mentioning the symptoms which are supposed to characterise the passage of biliary concretions through the gall-ducts, observes, that "in many such cases, no gall-stones can be detected in the evacuations when submitted to examination, but instead of gall-stones, when the evacuations have been repeatedly washed, the residue has exhibited a large quantity of flakes, mostly torn into irregular shapes, and appearing to have formed parts of an extensive adventitious membrane of no great tenacity or firmness."

"In the first of the cases which came under my notice," says Dr Powell, "this membrane was passed in perfect tubes, some of them full half a yard in length, and certainly sufficient in quantity to have lined the whole intestinal canal. In the other cases also, the aggregate quantity has been very large, and it has continued to come away for many days, but it has been in irregular thin flakes of not more than two inches in extent, and not, as far as I could discover, of the perfect tubular form, which would probably also have been broken down by the agitation in water, if it had existed in its first passage out of the body."

"I have definitely examined," continues this author, "four such cases, in all of whom the leading symptoms have been similar, and have led me to suspect the passage of biliary concretions at the time. They have all been adult females, and have occurred in private practice. I had attended but one of them previously to this attack, and she had frequently suffered from occasional pain in the intestines, and derangement of her powers of digestion, with flatulence, and a sense of suffocation. A similar history of liability to frequent recurrence of pain, accompanied by indigestion, was related to me in the other instances."

"The more violent seizures under which I saw all the patients, consisted in a sudden and excessive pain in the epigastric region, increasing in paroxysms very frequently, rather relieved by pressure of the patient herself at the time, but leaving great soreness and tenderness during the intervals. This state continued under four days; during it the stomach was very irritable, and the tongue coated and clammy. Jaundice came on at an early period, and the stools were white, brown, or somewhat greenish, and streaked in colours, until the films began to pass, when they were mixed with a full sufficiency of bile, but not at first of a healthy colour. The pulse throughout was calm, moderate and natural, in none of the instances amounting to 90. It of course did not indicate the existence of any inflammatory action, and still less was it disposed to assume that peculiar irritative quickness which marks enteritis. In one case, I noticed a very considerable hardness and contraction of the abdominal muscles, and in another, there was superadded to the above symptoms, a difficulty in passing the urine, with pain in the region of the bladder; and here the use of the catheter became necessary. Under the steady use of a mixture of the compound infusion of gentian, and infusion of senna, with the addition of liquor potassæ, repeated so as to produce four or more stools in the twenty-four hours, the flakes first separated and continued to do so in great abundance; the jaundice disappeared, and the patients recovered health and strength.

"I missed the opportunities," Dr Powell adds, "of examining the qualities of the flakes thus evacuated, but a quantity of them was put into spirit of wine for preservation, and was contracted by its action, so as to look almost fibrous rather than membranous, as at first, by which one is led to suppose that they may consist of albumen, though this is only a supposition. It is very different from that effusion which often coats the serous membranes of circumscribed cavities, which remains attached to the part from which it is effused, permanently agglutinates neighbouring surfaces, and becomes an organized substance."

Case 23. An officer, aged 45, had from his boyhood, frequently suffered from epistaxis. From his 15th year he had been subject to hæmorrhoids, at first open, afterwards blind, with constipation, flatulence, congestions, palpitation of the heart, and other hypochondriacal ailments, and not unfrequently with tertian and quartan fever. The hypochondriacal affections afterwards increased, accompanied with spasms and pains which forced him to cry out. He had frequent attacks of hæmoptysis, a sense of weight in his chest, feverish paroxysms, and convulsive cough. After the long-continued use of clysters, an immense quantity of mucous and atrabilious matter was passed daily by stool. At the same time salivation came on spontaneously. This was succeeded by inflammation of the lungs terminating in miliary fever. The clysters being continued, he frequently passed a quantity of matter, amounting to several pounds, partly consisting of black and fetid blood, partly of mucus with firmer masses of about the size of an egg. At last polypous matters were discharged, some of which, resembling blood-vessels in appearance, were about a foot and a half in length. So great was their resemblance to blood-vessels, that some young physicians actually mistook them for these. This evacuation continued to take place daily for nearly two weeks, the patient in the mean time daily recovering health.

Case 24. A man of very active habits, but who had previously suffered from several very serious ailments, particularly inflammation and suppuration of the kidneys, and pains in the joints and in the head, complained, when seen, of an unneasy feeling in the abdomen, involving the hypochondria and loins, and extending to the region of the umbilicus, of a bitter taste, loss of appetite, habitual costiveness, and constipation of several days continuance, the pulse being full and strong. No great change seems to have taken place in the patient's condition till the sixth day, when after the introduction of a hot clyster he experienced a pretty sharp pain in the region of the umbilicus, and in consequence of an emetic which he took, he vomited a large quantity of acrid bile. On the eighth day he seems to have experienced something like an apoplectic attack, which, however, soon passed off: on the ninth he discharged a quantity of pure blood, and it was subsequent to this that he, on repeated occasions, discharged a quantity of membranous, fibrous, or cartilaginous concretions, with more or less blood. This discharge is last mentioned as having occurred on the twenty-third day of the disease; subsequently to this he seems gradually to have improved, and to have ultimately been restored to perfect health.

Case 25. "A lady of delicate habit, 28 years of age, has been long labouring under a peculiar irritability of the rectum, giving rise to some degree of chronic inflammation, and a forcible contraction of the sphincters on evacuation. She has already discharged this kind of effusion for six weeks, and in tubes so perfect, as at first to have excited no small alarm in the attendants who noticed it. It is now in some degree on the decline, both in quantity and tenacity."

Case 26. A woman about 30 years of age, unmarried, corpulent, and of robust stature, complained for a length of time of uneasiness in the abdomen. The only other marks of indisposition seem to have been, that the tongue was covered with a dirty-white crust. She had at all times an unpleasant taste and a variable appetite. The alvine dejections were natural, but evacuants administered either above or below, brought away an incredible quantity of mucus. When she took food, the first mouthfuls were swallowed with great difficulty; solids passed however more easily than liquids. By continuing to eat she got rid of a sensation in the fauces, which was always present when she did not eat, viz. a sensation as if some mucus or a worm was rising up. She likewise complained of pains at the place where the pharynx ceases and the œsophagus begins, though when the fauces were inspected no morbid appearance could be discovered. She always felt a sensation of emptiness in the stomach, which sometimes increased even to nausea, and she complained likewise of compression and tearing in the stomach, sides, and back, and of a weight in the umbilical region. These uneasy feelings continued the same in every position, and during the night disturbed her sleep. In these circumstances she took it into her head that some little animal was concealed in her bowels, and frequently examined her alvine dejections, in which she found occasionally portions of albuminous matter, of a tubular form, and having a branch-like appearance. Dr Autenrieth has given a full description, as well as a delineation of several of these pellicular fragments. The only information given respecting the farther progress of this case, is the circumstance of the patient's having stated in a letter that she had happily got quite free of the suspicion of an animal dwelling in her bowels.

SERIES III.—CASE 27. A woman above 50 years of age, married, but never having had children, experienced very frequently symptoms that are usually referred to the uterus, and was subject, from time to time, to flatulent and gouty complaints, bilious colic, melancholy, and nephritis, on account of which she had repeatedly recourse to mineral and acid baths. About six years before the time of her being seen, she had had an attack of dysentery. The following is the general character of the attacks to which she was from time to time liable. She complained of continual lacerating pain, not however, at all times equally severe, stretching to the left side under the false ribs, sometimes to the groins, sometimes under the circumference of the stomach towards the right side. When this pain had lasted for some time, as for six weeks for example, she suffered most intense anguish in the præcordia, and alarming attacks of fainting, her whole appearance seeming to indicate instantaneous death. After this state had continued for a few days, membranes of different sizes, most of them small, were passed by stool, with or without blood, which when dried resembled skins from a sow's bladder shrivelled with heat. When this was over she recovered her ease, vigour, sleep, appetite, and returned to the usual exercise of her functions, experiencing no complaint except that the pain on the left side did not entirely disappear, though it became slighter than before. After some weeks, however, the attack recommenced, the membranes being at last discharged with the same deadly feeling of oppression.

Case 28. " A young woman, who in her younger days was threatened much with a decay, and for a dozen of years was subject to slow remitting fevers, all along had the most delicate stomach one can imagine, nothing but repeated cautious trials by herself being able to determine what drink she could bear."— " Testaceous powders generally gave her relief under the ill fits, but the continued use contributed nothing to harden her stomach against new attacks, a cautious diet being the only thing under which she got respite, though often she had attacks when most careful this way. For the bygone year she has had frequent fits of the dysentery affecting the whole abdomen, though the tenesmus continued longest, and gave her the greatest uneasiness. Under the first fit, which was the severest, observing that the mucous stuff she passed in great quantities lay in parcels somewhat firm and coherent, she had the curiosity to reserve some of it for my examination. This I found of different forms; some parts of it one would have reckoned from colour, length, and shape, to have been a round human worm bruised, but laying it in water and spreading it, I found it altogether fibrous, or rather vascular, made up of larger vessels parallel one to another, as thick as a horse's hair, between two and two of which ran other vessels as big as a human hair, of a reticular disposition. Some lozenges were about the fourth of an inch in diameter, but others much larger, all of them were transparent, and knotty like lymphatics. In this form I spread parcels of it out, between two and three inches in breadth, and six or seven in length; in several of them both the larger and the smaller fibres appeared every way entire, though easily broken when handled; in other parcels the fibrous part was so dissolved, that they appeared one coagulated lump like the white of an egg, though even these, when carefully examined, observed more or less of the fibrous part. Several times since, in the different attacks of the disease, the same mucous stuff has been examined, and found always of a piece with what we have described."

Case 29.—A lady between 30 and 40, suffered much from pain under the ribs of the right side, which was increased by pressure, and from headachs; attended by great dejection of spirits, drowsiness, and very obstinate costiveness. The complaint in her bowels, and the diseased secretion from the surface of some part of the intestinal canal, seemed to originate from a strong purgative medicine which was given to allay a febrile attack with which she was seized after lying-in; it succeeded in removing the fever, but with it her milk also, of which she previously had a great quantity. Her bowels were then attacked, and for three or four years, at the interval of two or three weeks (sometimes more frequently,) she passed by stool, after considerable griping, pain, and straining, attended by a sense of weight and pressure in the rectum, a kind of whitish very viscid jelly, mixed with shreds of coagulable lymph, and in such quantity as nearly to fill the half of a common sized chamber-pot. After the evacuation, which only could be produced by the aid of considerable doses of castor oil, she felt much relieved. In the course of eight or ten days, she was generally again seized by pain in her bowels, which was succeeded by very violent headach, often by nausea and vomiting. In consequence of these very severe attacks she had suffered very much in her health, having frequent cold fits, similar to the attacks of an ague, terminating in a hot fit and perspiration, but without much alteration in the pulse, or other febrile symptoms. Her body was always costive. There was nothing peculiar in the feculent matter, except the jelly above-mentioned.

Case 30. A woman of rank, 44 years of age, who had borne seven children, and had two abortions, laboured under great weakness of nerves, in consequence of frequent nursing, of repeated hemorrhage, of being affected with fluor albus, and of repeated attacks of dysentery. After having suffered from vertigo, dimness of sight, torpor of the limbs, pains in the head, and irritation of mind, she was seized one day about noon, with confusion of thought, difficulty of speech, and a certain degree of weakness in the right arm. There was much borborygmus; her urine was as clear as water; and subsequently her mouth was often twisted. Some time afterwards she was seized during the night with spasmodic shivering, which was followed by complete paralysis of the arm and foot. These parts, however, recovered after some time their power of motion.

On clysters being administered, the dejections procured were very pituitous, and the patient at length passed a ball of pituita which, after it was unrolled, presented the appearance of a long pipe more than a cubit in length. This pipe, after being macerated for three days in hot and cold fluids, both pure, and saturated with salts, retained its membranous figure. Large portions of pituita also were afterwards passed for some time, particularly oblong portions of about the thickness of the finger, covered over with a membranous pituita, and marked on the surface with furrows as if they had been forced through an aperture. Still the disease continued more or less.

Case 31. "A lady, aged 18, had suffered for a year or more from a disordered state of the bowels, accompanied by a most remarkable and unmanageable degree of tympanitic distention. When I saw her, along with Dr Combe, in the summer of 1826, she was affected with a variety of hysterical symptoms, with much weakness, impaired appetite, and a very disordered state of the bowels. Under a course of mild laxatives, combined with tonics, these symptoms gradually subsided; and when she returned to the country in August, she was in very good health, except that the bowels required the frequent use of medicine, and that she occasionally complained of headach, and of a feeling of heat in the epigastric region. In November the bowels again became more obstinate, and she was considerably annoyed with acidity. In the beginning of December, her throat was covered with aphthæ, and she brought up from it considerable quantities of thick white matter; and about the same time, the evacuations from the bowels began to contain much viscid mucus, and afterwards portions of a white substance. She now had thirst, was feverish in the evenings, and complained of pain in the right side of the abdomen, in the seat of the ascending colon. The pulse through the day was generally from 74 to 80. The aphthous state of the throat disappeared in the course of December, and afterwards the tongue was only occasionally observed to be red and tender, but the other symptoms continued to recur from this time, with numerous variations, for six or seven months, during the greater part of which period she was entirely confined to bed, and reduced to a state of the greatest weakness. The prominent symptom now was, frequent discharge from the bowels of immense quantities of a substance, which sometimes appeared in the form of pure transparent jelly; at other times of a long fibrous stringy matter, and frequently of large pieces of firm, uniform, tenacious membrane. These last were occasionally in flat portions several inches in length, and frequently formed distinct tubes; sometimes they were in masses resembling hydatids, and sometimes in membranous bags which enclosed healthy feces. The membranous crusts or tubes now mentioned, were frequently four or five inches in extent, and sometimes portions of white matter resembling cream were observed in the evacuations. The discharges of these various matters frequently ceased for several days together, the motions then becoming quite natural. The reappearance of the morbid discharges was generally preceded by a feeling of constipation, and a sense of heat along the intestinal canal, with a sensation of craving at the stomach, thirst and headach. The pulse generally continued from 70 to 80. The feculent matter which came off mixed with the morbid discharges, was of a natural appearance, but hard and lumpy. Her appetite was generally variable, and her digestion bad. Towards the end of April 1827, the symptoms began to subside, so that she was able to be out of bed daily for some hours. During May and June, the mucous and membranous discharges continued to recur occasionally, but in small quantities, and with longer intervals, and in July they entirely ceased. The bowels from this time continued natural, or were easily regulated by very mild medicines, and the evacuations were quite healthy. But from the middle of June, when the more decided improvement took place in the state of her bowels, she began to have a slight cough, and in July she was again confined to bed. In the beginning of August she was brought to town, when the prominent symptom was a disstinct paroxysm of fever which attacked her daily, beginning sometimes betwixt 12 and 2 o'clock, and continuing till evening. There was not much emaciation, but a pale unhealthy aspect; there was slight cough without expectoration, and occasional uneasiness in the left side of the thorax, where the respiration was very imperfect. The febrile paroxysms continued to increase in severity, with rapid failure of strength. In the beginning of September she began suddenly to expectorate large quantities of matter, which had a decidedly tubercular character; and she died on the ninth.

Inspection.—"The left lung was a mass of disease." "The viscera of the abdomen presented no appearance of disease, except the mucous membrane of the colon. Through its whole extent, it was thickly covered with small spots of a clear white colour, which were remarkably distinguished by their colour from the mucous membrane surrounding them. Few of them were larger than the diameter of large pin heads, and on minute examination, they were distinctly ascertained to be vesicles, very little elevated, but when punctured, discharged a small quantity of clear fluid; the whole surface of the membrane presenting a very peculiar appearance, from the immense number of spots with which it was covered; but the other coats were entirely healthy. In the mucous membrane of the caput coli, there were two distinct spots in a state of ulceration. The small intestine was healthy."

Case 32. In the spring of 1817, abdominal inflammation was very prevalent in Paris. It frequently terminated by the eruption of furunculi on the belly, and by the excretion (by vomiting and by stool,) of pseudo-membranous layers. A considerable number of persons affected in this manner, were treated in the clinical wards of the Hotel Dieu. In most of them, the inflammation first attacked the stomach and small intestines, and afterwards descended into the large intestines; this progress was particularly remarkable towards the termination of the epidemic. In examining the body of a young man, aged 30, who had died on the eighth day of a severe gastro-enteritis, the stomach was found lined with a false membrane throughout the whole of its pyloric half. The villous coat was uniformly erythematous. On its surface there existed two brownish-red zones, unequal in length and extent, which followed the longitudinal direction of the organ. These bands were also covered by the false membrane, but this inflammatory concretion was softer and less adherent over them, than over the other parts of the villous coat of the stomach, though, indeed, it was everywhere easily detached. The muciparous membrane was very obviously thickened, and easily torn off in shreds.

CASE 33. A woman 26 years of age, entered the Hotel Dieu, on account of an intermitting fever, and was brought to bed there without any untoward occurrence. Ten days afterwards she was seized with dysentery, not very severe. This disease seemed to be advancing towards a favourable termination, but on the tenth day the symptoms increased in severity, and continued till the death of the patient, which happened on the 34th day.

On dissection, the colon throughout its whole extent, and a part of the rectum, were found lined by a false membrane, under which the villous coat was red and slightly thickened. At some points on its surface there existed violet spots resembling ecchymoses, formed under the internal membrane of the intestine, but they were in fact produced by a kind of combination or infiltration of blood with the texture of the villous membrane. The pseudo-membrane was very adherent at some points; at others it was detached, and of a softer and less resistent texture than at the parts where it was adherent; at some places it was separated from the internal membrane, by a layer of puriform mucus. There were pretty extensive points at which false membrane did not appear to have existed; in other places it was perforated, and as it were worn away, for its borders were thinned, so that the colour of the subjacent membrane could be perceived through it.

CASE 34. A woman, aged 53, having swallowed by mistake about a spoonful of nitric acid, immediately rejected the greater part of it. The effects, however, were so severe, that after about twenty days, she discharged by stool, after many efforts, a long membranous packet consisting of a single piece, singularly folded and rolled up on itself. This body having been well washed, extended, and examined, presented the form of the œsophagus and stomach in all their dimensions. It was obviously the internal membrane of these organs, which had been raised and detached throughout its whole extent at once. On the slightest inspection its texture was recognizable, the change it had undergone being pretty nearly equal throughout. It was from one to two lines in thickness, and of a well-marked brown colour. The portions corresponding to the large and small extremities of the stomach were thinned, and pierced with several holes. The woman having died two months after this occurrence, the body was opened. The internal surface of the œsophagus and stomach was very smooth and polished, spotted and shaded with red of more or less brightness, and had altogether an unusual appearance.

Though the following case differs from those already detailed in the direction in which the membranous discharge took place, it has sufficient analogy with them to justify its introduction here.

Case 35. A man, aged 50, of a feeble constitution, and addicted from his youth to the excessive use of wine, experienced, at the age of 42 years, an attack of Painters' colic, so severe as to deprive him, for some hours, of sensation and consciousness. This recurred for several years at different intervals.

When visited, he was found seated in bed, with his head resting on his shoulder, this being the only position he could support; his face was pale, and covered with a clammy sweat, and his tongue as if it had been cauterized by a liquid caustic; he was coughing frequently, though with difficulty and pain, and breathing very laboriously. He complained of a dull pain under the xiphoid cartilage, and of an acute pain at the lower border of the false ribs, upon the left side. His pulse was small, contracted, and frequent, and he had frequent hiccough and vomiting of mucous matters. The whole of the symptoms, and particularly the state of the tongue and of the throat, led the physician to suspect that this person had taken some violent poison; but he obtained satisfactory assurances that this was not the case. The patient had been suffering for eight days from a severe cold, which had obliged him to keep the house.

During the first five or six days after he was seen, the pain continued, though less severe, with nausea and pretty frequent vomiting; on the evening of the 7th day, he had violent cough with threatening of suffocation; he vomited a quantity of very fetid pus, and passed a similar matter by stool. The purulent discharge continued the next day, amounting to about a pound, and for seven days after this he seemed to be gradually recovering. On the 15th day he experienced a sensation of a burning heat extending from the pharynx to the stomach; the same evening he suffered severe pain in the epigastrium, with hiccough and nausea; and he vomited, along with a large quantity of blood, a membrane resembling a portion of a sac, of from four to five inches in length. The following morning he had a similar attack, and vomited a membranous sac representing three-fourths of the stomach, which would have been completed by the first membrane, if it had been preserved.

On examination of this sac, it was found to be seven inches in length; longitudinal and circular fibres were seen in it, which were covered more or less by a dense cellular texture; the mucous membrane was recognised over the whole of its internal surface. The upper border represented the small curvature of the stomach, and in it traces of the coronary vessels were found; the lower border resembled in every respect the large curvature of the stomach. At the right extremity there was an aperture about half an inch in diameter; the left extremity was very large in consequence of its wanting about a third of the pouch; the borders were thin and fringed. There were several holes around this, the inner surface was generally of a deep red-colour, and spots of gangrene were scattered over it; the part corresponding to the pylorus and commencement of the duodenum was tinged with bile.

The patient seemed gradually to improve for nine days after the discharge of the second membrane; but on the tenth day he died, without exhibiting any symptoms besides those of great debility.

On examination of the body after death, the Stomach was found occupying somewhat of a perpendicular direction, and a little distended. Being opened throughout its whole length on its anterior surface, and the incision extended some inches into the duodenum, it was found filled with coagula of black blood, the large *cul de sac* was of a red-colour, and its parietes were thinner than natural.

The red-colour and thinning of the parietes were remarked here and there throughout the rest of the viscus, but it was not ulcerated, and contained only a very small quantity of pus, some spoonfuls of which could be pressed from the spleen into the stomach. The peritoneal membrane did not appear affected, proving that some exterior portions of the sac which had been taken for portions of peritoneum were only a denser cellular texture. Fleshy fibres were everywhere observable, but they appeared less numerous in the large *cul de sac* opposite the spleen. A probe introduced into the aperture by which the pus reached the stomach, penetrated into a membranous sac which surrounded the spleen. An incision made into this sac brought into view the spleen floating in pus, altered in its size, as well as in its substance, and breaking down in water like pulp.

On comparing this stomach with a healthy one, it was observed, 1*st*, that the colour was not the same. 2*d*, That the mucous membrane which forms many rugæ in a stomach which is not diseased was entirely wanting in this one. 3*d*, That the thickness of the parietes was evidently less in this stomach than in that with which it was compared.

Such are the cases of Pseudo-membranous alvine discharge which I have been able to find upon record. I should next proceed to detail some of those which have fallen within my own observation, or been communicated to me by others, and to deduce the general conclusions to which they seem to lead. These purposes, however, I must defer to another occasion. In the meantime, it may tend to throw light on the morbid conditions of the mucous membrane of the alimentary canal, on which this form of discharge depends, if we take a slight survey of the observations of those who, in *post mortem* examinations, have found this membrane more or less extensively covered with albuminous exudation, without its having been observed during life that pellicular substances were contained in the alvine evacuations.

Dr Monro, in his valuable work on the Morbid Anatomy of the Gullet, &c. has very correctly described the appearances which albuminous exudation exhibits in this situation. "When the villous coat of the alimentary canal," says he, "is the seat of inflammation, the diameter of the part which is inflamed is sometimes much diminished by the effusion of coagulable lymph upon its villous coat. The quantity of coagulable lymph effused is very various; sometimes it is as thin as a wafer; on other occasions, in such quantities as to fill the greater part of the affected bowel. In some cases, it forms only a thin lining to the villous coat, or appears in the form of tattered shreds; in other cases, it fills up the spaces between the valvulae conniventes; in others, covers these, and sometimes it takes the form of small tubercles, of a conical figure, which have been minutely described by Dr Donald Monro, by Sir John Pringle, and Sir George Baker, as having been found in the bodies of persons who have died from dysentery." Dr Monro mentions, that he has also seen a number of small cylindrical bodies projecting from the villous coat of the intestines, and which seemed to be chiefly composed of masses of coagulable lymph.

I have already had occasion to allude to the occurrence of albuminous exudation in Aphthous inflammation. In this affection, the exudatory inflammation seldom extends lower down in the alimentary canal than the œsophagus. This fact was particularly noticed by Dr Baillie, who remarks, that "the œsophagus is frequently lined with a layer of coagulable lymph, which is continued from the cavity of the mouth. This, it is said, sometimes extends over the whole intestinal canal; but I believe this appearance to be extremely rare, and it commonly terminates at the lower end of the œsophagus. The mucuous membrane of the mouth is, at the same time, much more vascular than in its natural state, shewing a deep red colour; but in examinations after death the appearance of greater redness is sometimes scarcely observable in the œsophagus. This disease is known under the name of aphthæ, and is much more often to be observed in the living than in the dead body." *

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* Morbid Anatomy, edited by Wardrop, p. 90. M. Cruveilhier, in reference to this passage, states, that he finds in M. Dupuytren's notes a very remarkable ex-

The general accuracy of Dr Baillie's statements, respecting the morbid appearances found in cases of aphthous affection, seems to be fully confirmed by those who have more recently investigated the subject. In M. Bretonneau's Traité de la Diphtherite, I do not find any reference to the occurrence of a membranous concretion lower down in the alimentary canal than the pharynx, except in the cases of two young children in whom a thick consistent membranous tube, ensheathed in the œsophagus, was traced as far as the cardia. P. 34. § 35.

M. Lelut has seen the exudation, however, on the inner surface of the stomach. "The Muguet," says that author, (Breschet's Repertoire, iii. 81,) "considered in its material nature only, is a false membrane, which in new-born children is seated on the mucous membrane of the supra-diaphragmatic portion of the alimentary canal, and on the mucous membrane of the stomach, and which I have never seen extend beyond the stomach into the rest of the alimentary tube."—"During life and after death, the false membrane in which the muguet consists may be seen above or below the epithelium; but hitherto its primary seat has not been incontestibly ascertained." M. Lelut mentions, that he has never found the slightest trace of the matter of muguet in the alvine evacuations, from which he infers that this matter is not formed below the stomach.

M. Billard, in his Traité des Maladies des Enfans, p. 315, remarks, that the change in the secretion of the mucous membrane in which muguet consists, occurs much less frequently in the stomach than in the œsophagus and mouth; for of 240 cases of this disease observed during the year 1826, in the "Enfans Trouvés" hospital at Paris, he saw the stomach affected with the exudation only three times, and the intestinal tube only twice. In one of these two last mentioned cases, the surface of the *ileum* was the seat of affection; in the other, the cœcum and colon. * P. 382-3.

Dr Abercrombie has given a very interesting account of a case of aphthous affection in an adult, which proved fatal, and in which the pseudo-membranous exudation extended to the cardia.

"A gentleman, aged 26, came to town in June 1826, to consult me about complaints in his head. On his journey he

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ample of inflammation of the œsophagus, terminating by the formation of a thick false membrane which lined this membranous and muscular canal throughout its whole extent. Essai sur l' Anatomie Pathologique, 1816, I. 146.

* Similar statements upon this subject, are to be found in the Recherches Pathologiques sur plusieurs maladies des enfans nouveau-nes, par P. S. Denis, Commercy, 1826, p. 510. See, however, in the Archives Generales de Medecine, 1829, xx. 580, a case of pseudo-membranous concretion, resembling muguet, found in the ileum and large intestine of a new-born child, by M. Guyot.

thought he caught cold in crossing the Firth of Forth, and when I saw him, he complained of his throat, and there was a glandular swelling on the right side of his neck. His voice was hoarse, with a peculiar husky sound. The fauces were of a bright red colour, without much swelling, but were covered in several places with aphthous crusts. He was at this time not confined, and there was no fever; but, after a few days, he became feverish, the other symptoms continuing as before. He was now confined to bed and actively treated, and after eight or nine days he was much better, so as to be able to be out of bed; but there was still some rawness of the throat, with small aphthous crusts, and a husky sound of the voice. After a few days there was a recurrence of fever, which now assumed a typhoid type, with considerable appearance of exhaustion. He had some dyspnœa, with considerable difficulty of swallowing. The attempts to swallow excited sometimes cough, and sometimes vomiting; and by both he brought up considerable quantities of a soft membranous substance. He became more and more exhausted, without any remarkable change in the symptoms, and died at the end of about three weeks from the first appearance of the disease. For twelve hours or more before his death, he swallowed pretty freely.

Inspection.—The whole of the pharynx was covered by a loose soft adventitious membrane, which also extended over the epiglottis, and portions of it were found lying in small irregular masses within the larynx, at the upper part. A similar membrane was traced through the whole extent of the inner surface of the œsophagus, quite to the cardia. Near the cardia, it lay slightly attached, forming a soft continuous mass about a third of an inch in diameter, and with the œsophagus closely contracted round it. The other parts were healthy."

M. Andral mentions,* that he had found the whole internal surface of the pyloric portion of the stomach lined by a grayish tenacious layer, coming away in shreds, simply laid upon the mucous coat, which it at least equalled in thickness. In a young girl twelve years of age, whose stomach, on its internal surface, presented a great number of red patches, extending in the form of large bands, from the cardia to the pylorus, "we found," says he, "each of these patches covered by a membranous grayish curd-like layer. In the intervals between them, the internal surface of the stomach was very white, and was not covered by any false membrane." In this case the whole air-passages were lined with false membrane, and the pharynx and œsophagus were affected as well as the stomach.

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* Clinique Med. Fièvres, p. 372; and Precis d'Anat. Patholog. ii. 161.

The inflammatory action which gives rise to pseudo-membranous exudation on the internal surface of the alimentary canal, may be occasioned by irritating substances that have been swallowed. "The effect of corrosive liquids on the œsophagus," says Mr Mayo,* "is to produce, in the lowest degree, separation of the cuticle; in a higher degree, effusion of lymph; in the highest, sloughing of the lining membrane to a greater or less extent; which being thrown off leaves a granulating surface, that cicatrizing contracts and narrows the canal, establishing permanent and fatal constriction."† Dr Baillie mentions, that in cases of poisoning by arsenic, he has seen a thin layer of coagulable lymph thrown out upon the inner surface of the stomach. In Dr Roupell's Illustrations of the Effects of Poisons, the first plate represents the stomach, &c. of a dog poisoned by a drachm of arsenic; the internal surface of the stomach is of a deep crimson colour, except in some spots which are covered with portions of yellow matter. These are said to be the arsenious acid itself enveloped in mucus, and adhering to rugæ, but easily detached by the scalpel. Is this the substance which Dr Baillie regarded as a layer of coagulable lymph, or, if different, by what marks are these two kinds of substance to be distinguished from each other?

Mr Howship mentions, that in examining the body of a child four years old, who had died twenty-six hours after drinking boiling water out of the spout of a tea-kettle, the following appearances presented themselves. The stomach externally had no appearance of inflammation; on the œsophagus and trachea, however, there was external redness. Internally the œsophagus was evidently somewhat inflamed, as was the mucous membrane lining the trachea, but in neither of these canals was there any distinct trace of effusion. Just within the cardiac orifice of the stomach, an effusion of coagulable matter, mediate in appearance between lymph and ropy mucus, had taken place, and that so decidedly as to give the idea of an additional membrane lining the cavity, and visibly terminating at the cardia. This appearance was lost towards the pylorus, by the effused matter insensibly assuming the mucous character. In a few points, the villous membrane presented small spots of capillary vascularity.

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* Outlines of Pathology, p. 282.

† It were to be wished that in describing and delineating the effects which corrosives produce on the alimentary canal, pains were taken to distinguish between those that depend upon their chemical action and those that depend upon the inflammatory action which they occasion. The experiments made by M. Orfila, with a view of obtaining means of distinguishing whether a poison has been introduced into the alimentary canal during life or after death, would form a necessary introduction to an investigation of this kind. The difference in the appearance of the epithelium in cases of poisoning by nitric and by sulphuric acid, as represented by Dr Roupell in his 4th and 5th plates, is very striking.

The exudation of coagulable lymph on the mucous surface of the alimentary canal may occur, however, independently either of aphthous affection or of the action of corrosive substances.

Mr Howship, in speaking of inflammation of the stomach says, "Examined after death, the stomach exhibits the common effects of inflammation; a considerable redness of the internal or villous coat is the most frequent appearance, sometimes combined with effusion of albuminous matter into the cavity. * * * * Among many rare preparations in Dr Hooper's collection, are two specimens of particular interest. One of these is the section of a stomach, the coats of which are much thickened from a deposit of coagulable lymph. The patient was the subject of inflammatory fever; all at once the symptoms left him, upon the accession of acute gastritis, which in two days proved fatal. The other is the inverted stomach from a fine youth who died on the fifth day of acute gastritis. The internal surface is copiously fringed with effused coagulable lymph, here and there loosely suspended from the rugæ. I have in my own possession," continues Mr Howship, "the stomach of a child only two years old, who died from inflammation of the stomach, connected with hydrocephalus; the stomach is inverted, and the mucous membrane, finely injected, demonstrates to great advantage the effused and white coagulable matter hanging in fringes from every part of the injected surface."

Dr Godman of Philadelphia gives * the account of the dissection of a woman, aged apparently about 25 years, extremely emaciated, and presenting marks of extensive pulmonic disease, in whom the internal surface of the stomach was found lined with a thick investment of mucus, so tenacious and dense as to appear like an additional coat. In attempting the removal of this, the stomach was inverted, and washed, first in cold, and then in warm water, but ineffectually; it was then washed with soap and water without any notable quantity being separated, and finally, was rubbed between the hands as in washing clothes, by which means a few flakes were detached, but the greater part still remained adherent. The stomach contained a considerable quantity of ether mixed with other fluids.

Dr Baillie mentions his having seen, in violent inflammation of the intestines, scattered portions of coagulable lymph thrown out upon the surface of the mucous membrane; this, however, he says, is very uncommon.

In a case of *Enterite Couenneuse* communicated to the Anatomical Society of Paris by M. Pailloux, * the mucous membrane of the small intestine was covered with a pseudo-membranous layer extended uniformly over its surface. The follicles did not seem to have had any share in the production of this false membrane, which, it was remarked, perhaps differed only by its continuity and its thickness from the small isolated patches secreted in the muguet by the villi of the intestines.

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* Philadelphia Medical Journal for May 1825, p. 93.

† Revue Medicale, 1830, ii. 397.

Fernelius relates, that a patient suffering under a similar but more severe affection than the subject of Case 5, experienced complete obstruction of the bowels, and at length died, the belly having become greatly swelled. On dissection, it was found that the colon was so completely stuffed with concrete Pituita as to seem quite solid, and to prevent entirely the passage of feces. *

In the catalogue of the preparations in the Anatomical Museum of Guy's Hospital, mention is made (No. 1857) of a portion of colon with a layer of adhesive matter forming an adventitious membrane on its inner surface, I am informed by Dr Hodgkin, that no particulars are known with respect to the case from which this specimen was obtained.

Dr Horner of Philadelphia, in his Treatise on Pathological Anatomy, p. 89, says, " In the case of an intus-susception of an infant, in the Anatomical Museum, there is a thin crust of lymph upon the mucous membrane of the gut; and in an erythematous colon from the Alms'-house, presented to me by Dr Hodge, where there had been an enormous distention with feces, he, and Mr Chew, resident pupil, were of opinion that there was a lining of coagulable lymph."

Dr Monro has delineated,† a portion of ileum contained within a herniary sac of a crural hernia, in which the cavity of the protruded portion of intestine was nearly filled by coagulable lymph, the obstruction being so complete at one part, that not even a small probe could be passed from the upper to the under part of the strangulated intestine.

The same author also mentions (p. 121.) his having seen in the collection of the late Mr A. Burns of Glasgow, a specimen taken from a child, where the same kind of gelatinous substance as that discharged by his patient, case 29, mixed with coagula-

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* Dr Monro relates a case communicated to him by the late Dr Walter Graham, of Dalkeith, of a boy eleven years of age, en the examination of whose body after death, it was found that, " about an inch below the pylorus there was a small hole, out of which the feces, or rather the indigested aliment passed, and was discharged by the umbilicus. The remainder of the intestinal canal, not an inch of which could be traced below the opening, was converted into a hard fatty substance, which, along with the other parts, was much diseased, and adhering firmly to the omentum and peritoneum." Dr Monro seems to regard this as a case in which the intestinal canal was plugged up by coagulable lymph, but I confess there is nothing in the description of the appearances which would lead me to this conclusion.

† Observations on Crural Hernia, Tab. 5th, fig. 2d, and Morbid Anatomy of Gullet, &c. Plate xiv. fig. 2.

ble lymph, adhered very intimately to the villous coat of the sigmoid flexure of the colon and the rectum; and above the sigmoid flexure the intestine had given way, and the ruptured part was also covered by the same kind of jelly. In this case, the rectum was considerably constricted for the space of four inches.

M. Andral in his Clinique Medicale (Fievres, p. 282,) gives an account of the dissection of a case of fever, in which the internal surface of the rectum was lined, throughout the greatest part of its extent, by a pultaceous grayish membranous matter, below which the mucous membrane was red and ulcerated at several points. In his Precis d'Anatomie Pathologique, this author alludes (ii. 161,) to his having twice found the internal surface of the rectum, and once that of a part of the colon, lined by a semi-concrete layer, resembling thick cream, in which no trace of organization could be discovered, and which could not be raised in a tubular form.

"In the small number of cases," says M. Andral, "in which good observers have ascertained, either in the stomach or in the intestines, the existence of pseudo-membranes, they have given the following description of them. The pseudo-membranous patches which M. Billard found in the stomach of three children, one of them four, and the other two six days old, appeared to him to be formed by an agglomeration of small white points raised upon the villi of the membrane, and adhering firmly to them. Below these points the villi were very prominent, swelled, red, and bloody at their extremities. M. Lelut, in the cases which he had occasion to observe, was, like M. Billard, persuaded that the false membrane was arranged in points, sometimes conical and covering a large space, sometimes isolated from one another. In two of the cases related by M. Billard, and in those mentioned by Lelut, no follicles were observable in the stomach. In M. Billard's third case, there were found, along the small curvature, several swelled follicles surrounded by a red circle; but even in this latter case, it was not at the parts where the enlarged follicles existed, that the pseudo-membranes were found. It would appear, then, that the villi have much more to do with the production of these pseudo-membranes than the follicles. This, however, applies only to the subdiaphragmatic portion of the alimentary canal; for in the mouth and pharynx, as well as in the air-passages, the mucous membrane has no villi, and still pseudo-membranes are formed there, much more frequently than in the stomach.

"In the intestines, the pseudo-membranes presented themselves to M. Billard as a mass of small whitish flocculi, so adherent to the villi, that they could be removed only by being strongly scraped with the scalpel. Some of these flocculi, however, were found in the midst of the feces."

Art. X.—*Experiments and Observations on the Sounds of the Heart.* By Robert Spittal, Fellow of the Royal College of Physicians, and Physician to the Royal Public Dispensary of Edinburgh.

As there is reason to believe, from the results of the last meeting of the medical section of the British Association, that investigations on that most difficult but interesting subject, the action of the heart, are now engaging the attention of physiologists, I beg, with all deference, to submit the following observations on the sounds of that organ to the consideration of these inquirers; not that they will find in them any thing like decided proof in support of any exclusive theory, but simply because they appear to be of such a nature, as, while they certainly do not throw unnecessary impediments in the way of the inquiry, may lead to more careful and less objectionable methods of investigation; perhaps to the elucidation of certain points on which there is so much difference of opinion; if not, to a certain extent, to the amalgamation of some of these views, so opposite in their nature, and yet so exclusively adopted by their various supporters.

In the month of July last, subsequent to some observations, made by the Edinburgh Committee of the British Association, on the action of the heart, in a horse, I took the opportunity of performing the following simple experiments, with the object of ascertaining whether or not a sound resembling either of the sounds of the heart, in health, could be produced by the stroke of that organ against the thorax, and in this manner testing the theory of Magendie, by assuming it as proved that the heart does strike the interior of the thorax during at least one of its movements; and, at the same time, taking into consideration the purely physical nature of such a phenomenon, and that a similar motion artificially produced in the dead body would most likely not materially modify the results.

Exp. 1.—For this purpose, immediately after the animal had expired, and the heart had ceased to contract, that organ was removed from the body. It soon thereafter became firm and contracted, and in this condition the following observations were made with it. The stethoscope was applied on the external surface of the thorax, and the heart, re-introduced within that cavity, was made to strike with its apex the inner surface of the thorax immediately underneath the situation of the instrument, while the rapidity and force of the strokes were made to imitate as nearly as possible the action of that organ, as seen and felt on experiments on living animals. At each stroke a distinct sound was perceived, in general louder according to the intensity of the former, and very much of the same character as the first or ventricular sound heard during life. Accompanying this, there was, of course, a sensation of impulse, which varied according to the intensity of the stroke against the chest. It was also observed, that a sound occurred at each removal of the apex of the heart from its pleural surface after its approach, and this was found to correspond exactly with the act of separation, and had very much the character, in abruptness and shortness, of the second or clear short sound heard during life. These observations were repeated many times with similar results.

Exp. 2.—In this experiment, which was performed in a dog poisoned for another purpose, the heart was retained in its pericardium, which was not the case in the first experiment. On the heart being made to strike the thorax, as already described, two sounds were distinctly perceived; the one, corresponding to the stroke against the chest, resembled the first sound of the heart, but was rather less grave than usual; the other, corresponding to the act of separation, sharp and abrupt. In this case, the heart was not so firmly contracted as in the former experiment. These observations were frequently repeated with similar results.

Exp. 3.—From the strictly physical nature of the phenomena described, analogy of structure might almost have sufficed for actual observation; but as direct experiment is at all times more satisfactory, and, in the present instance, so easy of execution, I took an early opportunity of repeating the foregoing experiments on the human body, and found similar causes to produce like results; two sounds being produced by the apex of the heart treated as described in the former experiments.

Exp. 4.—The abdomen of an adult was opened, as was also the stomach, while the thorax was left untouched. The fingers were now inserted into the œsophagus for the purpose, if possible, of making the heart strike against the anterior walls of the thorax; this, however, only produced an obscure rubbing and slight gurgling sound, from the mixture of mucus and air in the œsophagus, corresponding to the motion of the fingers, but not at all resembling the sounds produced in the other experiments; and it is much to be doubted whether the heart was made to strike the thorax at all in this experiment. On the pericardium being filled with water, however, by a small opening in the præcordial region, it was found easy, by an impulse from below, to make the heart strike against the chest, and produce the two sounds formerly described.

Exp. 5.—In another adult, the contents of the thorax were removed, and that cavity filled with water. In this state of parts the stethoscope was applied on the thorax externally, while percussion was made with the point of the middle finger,—which for this purpose answers better than the heart, unless firmly contracted,—on the internal surface of the chest underneath the water, and opposite the instrument. At each approximation of the finger to the parietes a sound was produced; as also on the act of separation, and simultaneous with it, a second sound was heard. In this instance the sounds were more subdued than in those in which the thorax contained air, and, in this respect, seemed to resemble still more those of the living heart; and, as was mentioned in the first experiment, the sound produced by the stroke was louder according to the strength of the impulse of the finger; but so little was required for the production of the sounds, that the mere quick approximation of the point of the finger to the thoracic parietes was sufficient for the development of the first sound; while the second appeared to owe its existence to the act of separation performed in the same rapid manner. Indeed, the intensity of the sounds seemed to depend more upon this than on the strength of the impulse.

Exp. 6.—Lest the peculiar structure of the point of the finger might have had any influence on the effects produced, that organ was in several instances covered with a portion of the membrane of the pleura, and in this condition most of the foregoing experiments were repeated with similar results. In the course of these observations on the human body, it was noticed that percussion on the intercostal spaces produced louder sounds than when this was performed on the ribs, when, however, the sounds seemed sharper.

In detailing these experiments, nothing is farther from my intention than to advance them as proving, that either of the sounds of the living heart, in health, are exclusively owing to the causes mentioned, as capable of giving rise to sounds of a somewhat similar character in the dead body; and, whether the latter have any share in the production of the former, may perhaps be deduced from the following observations, taken in connection with the foregoing experiments.

The first point in the inquiry demanding our attention, is contained in the following query: Does the heart during its action strike against the parietes of the thorax? Now, there is no difficulty in answering this question, as almost every writer on the subject admits, that during the contraction of the ventricles, the heart comes suddenly in contact with the parietes of the chest; and this is generally said to take place in the human body between the cartilages of the fifth and seventh left ribs, and is allowed to be the cause of the impulse perceived in that region. To show that this is not only admitted, but that the impulse is believed to be tolerably energetic, we may quote the observations of at once the most distinguished and most recent authors on the subject before us. Dr Hope informs us, that during the contraction of the ventricles, "the apex is tilted forwards and upwards, and occasions the impulse against the ribs;" and also, that "this motion is performed with considerable velocity."* Dr Williams says, "that the auricular contraction is immediately followed by the ventricular systole, which is accompanied by the first or dull sound. This systole, by straightening the anterior convexity of the ventricles, brings their apex into forcible contact with the ribs, and thus is produced the impulse."† Bouillaud admits, that the ventricular systole takes place suddenly, and is followed by the diastole. The contraction of the ventricles consists in a sudden energetic concussion of the point of the heart against the side.‡ The Dublin Committee of the British Association conclude from their experiments, that "the ventricles, in their systole, approach the front of the thorax, and, by their contact and pressure against it, produce the impulse or beat of the heart."§ Such are the inductions from the most recent investigations on this subject, and, from repeated observations on living animals, I have arrived at the same conclusions. It may be admitted, then, with little risk of error, that the heart during its action, not only approaches the thoracic parietes, but strikes against them with a certain degree of force, as implied by the terms shock, concussion, and impulse, in common use among physiological observers. It is also as generally admitted, and the proofs are equally strong, although we think it unnecessary to state them more at length, that the first sound of the heart accompanies the impulse, and is immediately followed by the second, which takes place during the ventricular diastole, and precedes the interval of silence.

Let us now inquire what evidence there is in support of the idea, that either of the sounds of the heart owe their existence, in any amount, to the percussion of the heart against the parietes of the thorax. According to Dr Williams, "sound in a physical sense may be defined as motion of a certain velocity resisted with a certain force;"‖ and we are informed by Bouillaud that, "the shock of the heart against the thoracic parietes is one of the conditions proper for the production of sound.¶ Yet both of these authors entirely exclude this phenomenon as an element in the production of sound in the normal condition of the heart. But, possibly from seeing the difficulty of the position into which they have placed themselves, they afterwards admit the fact in certain anormal cases. For example, Dr Williams informs us, that "although it is proved by the preceding observations that the impulse of the heart against the chest does not produce

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[*] Hope on Diseases of the Heart, 1835, p. 42–44.

[†] Rational Exposition, 1835, p. 165.

[‡] Bouillaud, Mal. du Cœur, 1835, i. p. 88.

[§] Report of Medical Section, 1835.

[‖] Rational Exposition, 1835, p. 4.

[¶] Op. cit. p. 102.

its natural sounds, yet I am disposed to admit, that in violent action of the organ, its more sudden and abrupt strokes against the chest do cause a sound, which constitutes the loud termination of the first sound in these cases, and which seems nearer the ear, and more like a knock, than what is heard in the ordinary action of the heart. In common pulsations, the apex of the organ is drawn upwards and forwards at each systole, and sliding obliquely on the smooth pericardium, does not impel against the ribs with sufficient abruptness to cause sound. But in quicker and more violent pulses, the abruptness of the motion, and the force of the blow against the side of the chest, are such as can scarcely fail to produce sound."* According to Bouillaud, the percussion of the heart against the thorax does not produce any distinct sound in a normal state. But he conceives that "under the influence of very violent beatings it may be otherwise."†

To shew, however, that it is highly probable that sound is produced in the manner mentioned, in a much more extensive range of cases, if not, to a certain extent by this agency in every case, I beg here to refer to the foregoing experiments, by which it is distinctly proved that sound is produced by artificial percussion against the interior of the thorax, as well when that cavity contains air, as when filled with water; but, in the latter case, duller than in the former. Now, although neither of these conditions are proper to a healthy chest, still they represent opposite morbid conditions which not unfrequently occur, and in which the sounds of the heart are distinctly perceived, though sometimes modified; and it does not appear to me at all extravagant or unphilosophical to argue from these conditions, as from the chest in an entirely normal state. I think it likely that in the latter condition, if the experiment could be performed, the results would be somewhere between the two former; in which, in the case of the chest containing air only, the sounds were clearer than those produced under water, which again were somewhat duller than the sounds perceived in a normal condition of the parts in life. I am of this opinion from the fact of the lungs forming a physical state which may be considered the mean between the two conditions described. So much then in support of the principle laid down by Magendie, and to a limited extent supported even by Drs Williams and Bouillaud.

The next points of inquiry are, 1*st*, What degree or force of impulse is actually required for the production of sound under the circumstances mentioned; and is that of the healthy organ sufficient? 2*d*, What is the character of the sounds so produced; and do they at all resemble the normal sounds of the heart?

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* Op. Cit. p 178.

† Op. Cit. p. 193.

In answer to the first query, I again refer to the preceding experiments, in the account of which it is stated, that the degree of force required for the production of sound was very slight, and that a considerable sound resulted from the simple approximation of the point of the finger or apex of the heart, if of sufficient firmness, to the parietes of the thorax. That there is ample space in the human body for the heart to advance and retire from the walls of the chest, in the manner supposed by Magendie, appears not only from the foregoing observations, but likewise from the following consideration, viz. that the heart does not entirely occupy the pericardium, but is contained loosely in that envelope. But even this does not seem to be absolutely necessary to the motion of the organ, and in cases of universal adhesion of the pericardium to the heart, it appears to me quite possible for the organ,—projecting as it does into the left cavity of the pleura, and considering at the same time the great looseness of the cellular connections of the pericardium in the mediastinum,—to be tilted forwards and upwards, and to produce percussion of the thorax. And in such cases, we have not only the two sounds, but an impulse accompanying the first. I do not here allude to recent cases of pericarditis.

The amount of force required to produce sound in the dead body we have seen to be very small; and from the purely physical nature of the phenomenon, we have every reason to expect the same results from similar causes in the living body. Now, from frequent observation on dogs, I have not the slightest hesitation in stating, that the degree of impulse is considerably greater than was amply sufficient for the production of sound in the experiments previously recorded; and there is reason to believe, from comparative observations on these animals entire, and on the living human body, that the impulse of the heart is always stronger in the latter.

That the heart generally advances to, and retires to a certain extent from, the walls of the thorax during its action, may be considered as proved; but that it always takes place to the extent implied by the statements of Magendie, I think, may be questioned; at all events, from the following observations, this does not appear to be in all cases essential for the production of a certain degree of impulse. For example, in detailing one of his experiments, Dr Williams remarks, that "at each systole, the sudden tension or tightening of the ventricles was felt by the finger applied to their body, as an abrupt shock, with which the first sound exactly coincided."[*] And in an experiment on a dog performed last July, I find it stated in my notes, that while the finger was in close contact with the heart, the latter gave at each systole a sudden smart stroke to the former, and at each stroke a sound was perceived similar in character to the usual first sound. If an abrupt shock, then, can be produced against the finger under the circumstances mentioned, it is evident that the same may take place against the thorax, producing the impulse without necessitating the organ to retire much or even at all. It is probable that occasionally in enlargement of the heart, while a portion of the organ, of course the most anterior part, may constantly remain in contact with the parietes of the chest, the surrounding more posterior portions may actually advance and retire from the thorax during the action of the heart. It appears to me, then, from the foregoing observations, that the degree of force actually required for the production of sound under the circumstances mentioned, is by no means great, and that that of the human heart in health is amply sufficient.

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[*] Op. Cit. p. 171.

In answer to the 2d query, I beg also to refer to the same experiments. In these it is stated, that the sound produced by percussion against the interior of the thorax, very much resembled that heard during the systole of the ventricles, at which moment the heart strikes the chest; perhaps rather clearer in the case of the artificial pneumo-thorax. But this affords no valid objection, as it is not unusual to find the first sound altered, both as to length and clearness in a state of health; and on this point Bouilland remarks, that "he has observed in certain cases that the two sounds of the heart were nearly exactly alike, both as regards length and sound, and that it is in such cases the first which becomes clearer, and not the second which has lost its clearness. It is particularly in these individuals that the double sounds of the heart resemble the play of a machine with valves."*

Recent experimenters have endeavoured to prove, that the normal sounds of the heart are not at all owing to the impulse of the organ against the thorax, but in this they appear to me not to have succeeded. They doubtless have proved satisfactorily that sounds resembling those of the heart have been heard after a portion or the whole of the thoracic parietes had been removed, but not when all sources of sound, which might have resulted from percussion of the heart during its action, had been removed; and from all the observations I have made on this subject, it does not appear to be a matter of essential importance, that the heart should strike against the thoracic parietes for the production of sound. We at present confine our observations to the first sound, or that accompanying the impulse. In several of the experiments on dogs already alluded to, it was repeatedly observed, that when the heart was prevented from approaching the thorax by the interposed fingers, no sound was perceived by means of the stethoscope placed on the external surface of that cavity, provided the fingers were not permitted to touch the walls of the chest at the same time. When this was allowed, and these were placed close against the thorax, so as to form a portion of its parietes, as it were, a sound accompanying each impulse, was distinctly heard, of the same character as that perceived when the heart struck the thorax directly. As in this case then, the heart in most, if not all, of the experiments advanced against the views of Magendie, was permitted to strike against *something*, and this for the most part a firm body, in which instances we find that the intensity of the sound was scarcely altered; but when the stroke was against a soft body, the sound was always enfeebled. For example in the experiment of Bouillaud on a cock, we are told, that the sounds were heard by the stethoscope, applied directly over the heart; as also by the naked ear, a portion of cloth having been interposed to protect it from the blood, but in the latter case they were less distinctly heard. *(comme voilé.)*[*] In Dr Williams' experiments, the stethoscope was applied close to the heart, except in observations 1 and 2, of experiment II, to be afterwards adverted to; and the Dublin Committee, aware of this difficulty in the inquiry, used in their experiments a stethoscope cennected with a flexible tube and ear-piece, and in one experiment on a calf, they placed this instrument on the pericardium over the ventricles, and heard both sounds distinctly. In the experiments on the sounds with the sternum removed, they state, that " the flexible ear-tube was found to be serviceable in preventing the transmission of the shock or impulse which was felt when the common stethoscope was used, and which embarrassed the observation," (by the sound produced we presume). " The ear was now applied very near to, but not touching the heart, and both sounds were distinguishable but *feeble*. A small piece of board was placed over the surface of the ventricles, and kept in contact with the pericardium, and the common stethoscope having been applied to the surface of the board, both sounds were heard as distinctly, and very nearly as strongly, as when heard through the sternum."[†] In Dr Hope's experiments also the stethoscope was directly applied to the ventricles.

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* Op. Cit. Vol. i. p. 104.

That the sound produced by the percussion of the heart against a firm body, other than the thorax, is similar to the first sound, is evident from the following direct experiment of the Dublin Committee. " A calf having been stunned, the heart was taken out immediately, and placed on the table. The ear-tube was applied to the surface of the ventricles whilst they were still beating, and at each systole a sound was heard resembling that called the first sound; no second sound was audible."* In one of the experiments on a dog formerly alluded to, on the stethoscope being applied over the ventricles, two sounds were distinctly heard. Both were of the same character, and resembled the normal first sound. The one corresponded to the contraction, the other to the dilatation of the ventricles. In this case the heart was not removed from the body.

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[*] Op. cit. vol. i. p. 129.

[†] Report of Brit. Assoc. Med. Sect. 1835.

The experiment of M. Bouillaud on the cock, apparently discountenances the idea that percussion of the living heart against the stethoscope is capable of producing a sound like that of the first sound, perceived in ordinary circumstances. He says, that the *friction* of the heart against the stethoscope produced a single *bruit de frottement*, impossible to be confounded with the usual tic-tac of the heart.† But as no one, so far as I am aware, has advanced the notion that either of the sounds are owing to friction of the organ against anything, we cannot regard this experiment as militating at all against the views under consideration; and had the heart been permitted to tap or strike, instead of rub against the instrument, it is likely that a similar sound to that perceived in the former experiments, would have been heard in this case also.

With these facts before us, then, surely it is at least premature, and throwing obstructions in the way of free inquiry, and more accurate investigation, to draw the sweeping and decided conclusion, that the percussion of the heart against the thorax, in health, is incapable of producing any sound. In almost every instance noticed, the heart had something firm to strike against, which seems to be the most essential point; and it was observed in one case, that the sound was produced by the stroke of the organ even after it had been removed from the body; and this is an important fact, leading us at once to question the accuracy of the conclusions, derived from recent experiments, in which the heart *in situ* was permitted to strike against any, especially a firm object during its action.

In regard to those observations in which a portion of lung or cloth was interposed between the stethoscope or ear, as in the experiments of Williams and Bouillaud, it is evident that they only form an apparent exception to the foregoing statement, for, after compressing somewhat the soft interposed substance, the heart would meet, more or less according to the quality or quantity of the substance, with firm resistance; in the stethoscope in the one case, and the ear in the other; but, as in the familiar instance of muffling a knocker, we would expect the sound to be diminished by this arrangement, and such was the case, as noticed in the experiment of Bouillaud. Dr Williams does not inform us on this point, but only states, that "both sounds were distinctly heard through a lobe of the lung, interposed between the heart and the stethoscope."* I have tried the experiment in an artificial manner, by producing percussion on a portion of lung interposed between the stethoscope and the finger, and found a smothered resemblance, as it were, to the sound produced by percussion on the interior of the thorax. The experiments made with the flexible stethoscope of the Dublin Committee must also be regarded in the same light, for although the instrument might not transmit much of the impulse, it appears to me, that it would as easily transmit any sound resulting from the shock of the heart against its extremity, as any other instrument.

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* Op. cit.

† Op. cit. vol. i. p. 129.

But we may be told that both sounds have been heard when the heart struck against *nothing* in its motions:—let us consider this point. In the experiment of the Dublin Committee, already noticed, it is stated that the ear was applied very near to, but not touching the heart, and both sounds were distinguishable, but *feeble;* and Dr Williams observed, in his 2d experiment, that "before the pericardium was opened, the 1st and 2d sounds were very distinctly heard, although the heart touched no part of the parietes of the chest."† And in summing up the evidence against Magendie's views from the same experimental testimony, he takes the rather unphilosophical liberty of stating, "that the same sounds that had been heard before the chest was opened, were most distinctly produced after that operation, when the heart struck against *nothing* in its motions."‡ Now, while we freely admit the possibility or even the probability of the existence of some other assistant cause for the production of the first sound, besides the percussion of the heart against the thorax, the experiments quoted do not prove that the sounds heard, which there is every reason to believe were feeble, did not in the present instances arise from the shock occasioned by the sudden contraction of the organ during the ventricular systole, on the immediately surrounding parts; and after the experiment on the portion of lung, placed between the stethoscope and percussing finger, there is no improbability in the supposition. As to the condition of the heart, however, in this respect, we are not informed; but as it is stated, that artificial respiration was performed in both, we of course infer the presence of the lungs; so that when Dr Williams says that the heart struck against nothing in its motions, we presume he means that it did not strike against at least the anterior parietes of the thorax. It is mentioned that a portion only of the thorax was removed.

We may here notice an objection which has been offered by Dr Williams to the views advocated. In the Report of the medical section of the British Association, the learned author objected, "that if the sound depended on the impulse against the side of the thorax, the sound would be propagated all over the chest, according to a well known law in acoustics, and would be as audible over any part of the back as over the cartilages of the sixth or seventh rib."* Now, in every instance in which this can be done, investigations of a physical nature should be tested by experiment; a mere theoretical statement is of no value in comparison; and the instance before us is an example of the error likely to result from want of attention to this circumstance. It appears to me, that Dr Williams had never submitted this point to the test of experiment. If this had been the case, he would have arrived at a very different conclusion. I have repeatedly performed percussion, with the point of the finger, on the interior of the human chest as formerly described, as well when that cavity contained water, as air only; and found that a degree of percussion, quite sufficient to produce a sound louder than is heard in many healthy adults, was perceived to a very small extent around the point of percussion; nor were the resulting sounds heard distinctly many inches beyond this. For example, if percussion were performed in the space between the fifth and sixth ribs, and the stethoscope applied over the space between the fourth and fifth, or sixth and seventh ribs, the diminution of sound was very decided. Again, if the instrument was removed to the next space further off, the sound was in this instance perceived so feebly, that only an occasional beat, perhaps from being a little stronger than the rest, was heard. The sound in every instance, was found to diminish in intensity, in an inverse ratio to the distance from the site of percussion; when this was performed on a rib, the sound was more easily communicated. Although, however, it is common for the sounds of the heart to be heard only in, or near the præcordial region, still it is an ordinary observation, that in a very great many instances they can be heard beyond this; and in thin persons and in children, sometimes even over the whole of the thorax; but always diminishing in intensity, as the examination is made progressively from the region of the heart.

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* Op. cit. p. 173. † Ibid. p. 173. ‡ Ibid. p. 178.

We have not taken notice of that theory which attributes the first sound of the heart to the sound of muscular contraction, described by Dr Wollaston, and in the present instance so strenuously supported by Dr Williams, without, as it appears to me, anything like satisfactory evidence in its favour. This idea is altogether rejected by Bouillaud and others, as an explanation of the first sound of the heart; and it is somewhat curious to observe, as recently remarked, and shows the difficulty of the subject, that Drs Williams and Hope have arrived at different conclusions, as to the cause of the sound under consideration from the same experiments. The latter attributes it to three different causes, consisting, "1*st*, possibly of a degree of valvular sound; 2*d*, of a loud smart sound produced by the abstract act of sudden jerking extension of the muscular walls, in the same way that such is produced by similar extension of the leather of a pair of bellows, and this he calls *the sound of extension; 3d*, a prolongation, and possibly an augmentation of this sound, by the sonorous vibrations peculiar to muscular fibre, *(bruit musculaire.")* He also remarks, that "the sound of the heart during palpitation is, in some instances, of such extraordinary intensity, that it would do violence to all analogy to suppose it produced solely by *bruit musculaire*, and some of the strongest advocates for this *bruit*, have thought it necessary in such cases to imagine a sound produced extrinsically by the heart impinging against the thoracic walls."*

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* Op. cit.

The Dublin Committee are of opinion, that the first sound "is produced either by the rapid passage of the blood over the irregular internal surfaces of the ventricles on its way towards the mouth of the arteries, or by the *bruit musculaire* of the ventricles, or probably by both these causes." Here the sound of muscular contraction is admitted as probably having a greater share in the production of the first sound than in Dr Hope's statement; but Dr Williams' conclusions are of a much more exclusive character; he attributes the first sound entirely to the *bruit musculaire*, and to those who object to this view, he puts the following question. "If the first sound of the heart is produced by another cause, what becomes of the muscular sound, in this case of rapid muscular contraction?"†

Now, to answer this question properly, it is necessary, in the first place, to know the degree of sound which muscles under contraction generally produce, before considering that produced during the contraction of the heart. As to the former we know, that it is generally a dull rushing sound, during continuous contraction, totally different from that of the first sound of the heart, in which organ, as the contractions can scarcely be said to be continuous, we do not look for this species of sound, and certainly do not find it. We have as yet, then, no proof except that arising from analogy of structure, which would lead us to suppose that it does take place in the heart, but, from being so short and feeble, is probably drowned in some other accompanying sound. Dr Williams indeed states, that "it is very possible to imitate the first sound of the heart by suddenly contracting the muscles of the gently closed hand; but it is not to be expected that the sound of muscles remaining in a state of tension can give a similar sound. These produce a dull rumbling sound described by Dr Wollaston."—"The muscular contraction of the heart is pre-eminently calculated to produce sound, inasmuch as the motion is strong, abrupt, and simple, and the resistance considerable, and continued as long as the semilunar valves are open, and the auricular shut."*

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* Hope.—Appendix, p. 7.

† Op. cit. p. 168.

The evidence then, on which Dr Williams supports his theory appears to consist chiefly in this, that the sound resembling the first sound of the heart can be produced by sudden muscular contraction, under circumstances in which the sound resulting might be much more simply, and, as appears to me, satisfactorily explained by the quick abrupt stroke of the contracting muscle either against the ear directly, or indirectly, against the stethoscope, and of all methods of producing sound, the simplest and most effectual is by a sudden stroke; and it seems to be trifling with the question to pass over in silence this manifest cause of sound, which has been so distinctly proved to exist in the previous observations; and that which is termed by Dr Hope the sudden jerking extension of the muscular walls of the heart,—and by Dr Williams the sudden tension or tightening of the ventricles, will manifestly assist in producing the impulse and consequent sound.

We are told by Dr Williams that "it is almost impossible to touch, stretch, bend, or compress solids, without throwing them into sonorous vibrations,"† and, as we have adopted that which is admitted on all hands as the simplest, and most evident cause of sound, so we cannot but regard the observations detailed in support of Dr Williams' theory, as more favourable to the views now advocated; and in concluding this part of the subject, we may be permitted to say, that, if an answer to Dr Williams' query is not to be gathered from the foregoing remarks, we would reply by putting the following question. If the first sound of the heart is produced entirely by the *bruit musculaire*, what becomes of that which we have the strongest reasons for believing must result from the abrupt stroke of the heart against the thorax, during the contraction of the ventricles?

The difficulties which lie in the way of this investigation, however, are beyond doubt very great, and while claiming consideration for the views of Magendie in regard to the cause of the first sound of the heart, it would be premature to come to any decided conclusion on the subject. At the same time I cannot avoid coming to the conclusion that the foregoing observations render it highly probable that the percussion of the heart, against the thoracic parietes, during the contraction of the ventricles, assists materially in the production of the first sound, if it be not the sole agent.

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* British and Foreign Med. Journ. No. ii. p. 447.

† Op. cit. p. 167.

The theory of Magendie in regard to the second sound, does not appear to me to deserve so much consideration; for, although it is quite true, and I have repeatedly verified the fact by experiment, that the ventricles, immediately after their contraction, dilate suddenly and with considerable force, yet they do not appear to strike the parietes of the thorax during this action. But, it is easy to understand how, under certain circumstances, they might do so with force sufficient to produce a very distinct sound; and we find that M. Bouillaud admits, that in an abnormal state, the diastole of the ventricles might give an appreciable impulsion against the chest.* Judging, however, from the number of the explanations offered, it is possible that there may be more than one cause for this phenomenon; and from the various experiments of Rouanet, Williams, Hope, Bouillaud, the Dublin Committee, and others, it appears highly probable that the quick unfolding and tension of the semilunar valves is the chief. From the experiments in the beginning of this paper, however, I am inclined to think, that the act of separation of the heart from the thorax, after its approach, and which in these observations was found to produce a sharp short sound, somewhat resembling the ordinary second sound, may in certain circumstances be an assistant cause. This will no doubt depend very much on the manner of separation, as well as on the nature of the substance which comes to fill up the space surrendered by the retiring heart, whether this be air, liquid, pulmonary tissue, or simply a fold of the pericardium.

In several cases the second has appeared to me to resemble very much the sound of separation, as heard in the experiment with air only, in the thorax; having a short ticking or clicking character. For the production of this sound, it does not appear necessary that the complete separation of the whole anterior surface of the heart from the walls of the thorax should take place; and in cases of enlargement of the organ, this, we have reason to believe does not happen. We know from experiment, that the separation of a portion, is sufficient for the production of the sound in the dead body; and the more extensive the surface of separation, perhaps the louder will be the sound.

If this, together with the previous view of the subject be correct, then we can understand how, in certain cases, there might be three or even four sounds heard during one revolution of the heart; (and M. Bouillaud has described several of these, in which, however, the sounds were partly of a morbid kind,) viz.

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* Op. cit. vol. i. p. 94.

the 1st, synchronous with the impulse of the apex of the heart against the thorax; the 2d, with the separation of that portion of the organ from the chest; the 3d, with the dilatation of the ventricles in such cases as give an appreciable impulsion against the thorax; and the 4th, with the separation of the walls of the ventricles from the chest, immediately after their dilatation. But as two of these may occur at nearly the very same instant of time, especially during quick action of the organ, so there might only be three or two sounds, as usually heard, in consequence of the union of two into one. And in ordinary cases, with perfect integrity of the semilunar valves, one at least of the above would, according to the theory which has been adopted as most probably the chief cause of the second, be completely lost in the valvular sound. These remarks are merely thrown out as points for the consideration of those engaged in this inquiry, should they be deemed the least worthy of their regard.*

I have several times endeavoured to test the views supported in this communication, and, at the same time the valvular theory of the second sound here adopted, in the following manner, but as yet without success, viz. by rapidly passing a ligature around the aorta and pulmonary artery, through a small incision in the pericardium, insinuating the ligature behind these vessels, by the natural opening, and tying them close to the semilunar valves. In every instance, however, the action of the heart, though vigorous before, became immediately so enfeebled, after the operation, as to afford no useful result.

ART. XI.—*Conclusion of the History of a Case of Paraplegia from Injury of the Spinal Chord.* By JOHN HOME PEEBLES, M. D., Fellow of the Royal College of Physicians, &c. (Read before the Medico-Chirurgical Society at the Meeting of the 25th ultimo.)

I FORMERLY presented to the Society the history of a case of paraplegia, which was afterwards published in the Transactions of the Society in the 121st No. of the Edin. Med. and Surgical Journal.

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* In two instances I have heard three distinct sounds during one revolution of the heart; one of them, pointed out to me by my friend Dr Henderson, since writing the above, in a boy in the Royal Infirmary labouring under dropsy after Scarlatina, and in whom all the sounds were much alike, and more resembling the character of the second than that of the first, with a short pause after the third, thus, *tic—tic—tac—tic—tic—tac.* On examination after death, a small quantity of serous fluid was found in the pericardium, and the ventricles were somewhat dilated, especially the right.

I beg now to lay before the Society the conclusion of this case, which has been published in the 14th Vol. of the Essays of the Royal Academy of Padua, and a copy of which was transmitted to me by Dr Montesanto.

From the time of my last report of this case, no manifest change, it would appear, had taken place in the symptoms of the disease until the month of December of the same year (1833,) when the patient was attacked with similar symptoms to those that occurred in April previous, when he vomited much stercoraceous matter; but, although a long time had elapsed since that attack, nothing now was ejected from the stomach. On the 16th of this month the epigastric region became contracted and depressed in the upper part, whilst the lower portion of the abdomen was hard, tense, and distended, so that it appeared as if the body was divided by a strong band. Vomiting at the same time came on, after great suffering, of a little liquid inodorous insipid matter, and, shortly after, there followed some bitter secretion.

The pain and sense of pulsation of the spine were excessive, with burning heat. On the 28th, Dr Montesanto was called in consultation with the physician of the prison. To the excruciating pain was now added a sense of constriction in the epigastric region, and the arched state of the inferior part of the abdomen remained unchanged, even under strong pressure. Tremors of the arms and hands also supervened. These were more manifest in the right side, and they increased daily in severity. The patient became more enfeebled by the clonic convulsive movements.

The severity of the symptoms was moderated by local and general blood-letting and emollient applications, with total abstinence. But on the 29th the distention of the abdomen increased anew, and the convulsive motions of the right arm became more violent. On the evening of the 9th of January, Dr Fabris, Public Dissector of Anatomy, with Dr Montesanto, visited the patient. They found still the depression already mentioned under the false ribs, and likewise the swelling along the tract of the colon, and particularly on the right side. Nothing different from the natural state was discovered in the back, unless the spinous processes of two vertebræ, that the last of the dorsal and first of the lumbar were less apparent than the others.

The symptoms were somewhat relieved by the means constantly employed; but the patient continued to suffer without interruption from troublesome twitchings and contractions in various parts of the lower region of the abdomen, where during all his distress for many years he never had any suffering.

In the beginning of the present year, *œdema* of the lower extremities began to appear, especially in the left side, which gradually increased to such a degree as to assume the appearance of *phlegmasia alba dolens*.

On the 12th of May, Signor Fabris, Professor of Surgery, examined the patient. He found the *rectum* much contracted, and its surface covered with greenish inodorous mucus. At this time the pulse became more depressed and irregular, the countenance much swelled, and the thighs, particularly the left, more œdematous. Soon after this period, it is remarkable that some secretion of urine appeared after so long a lapse of time, a circumstance which was considered as indicating the malady to be drawing to a close. The urine voided was watery, limpid, and inodorous. It was sometimes suspended for a long time, at other times it was voided often, and in small quantities. It was observed there was neither incontinence nor *ischuria*, and there was no necessity for the use of the catheter, so common in cases of *paralysis* of the inferior extremities.

Nothing particular occurred till a short time before his death. This event was preceded by total aversion to food. Every attempt to swallow produced vomiting. He drank often a little water, which was always immediately rejected. The strength declined, emaciation increased progressively, the pulse was slender and weak, and the fauces were parched and dry, with a sense of hot burning in those parts.

The urine was still watery. The urethra was insensible to its passage.

On the 13th of February dissolution was approaching, and at this time there was discharged simultaneously from the mouth and *rectum* liquid fecal matter, without previous suffering.

On the evening of the 14th, this patient terminated his miserable existence, being thirty-six years of age, seventeen of which he had spent in prison. Immediately after his death, Dr Montesanto applied to the proper authorities for permission to examine the body, which was granted; and on the morning of the 16th, thirty-six hours after death, the examination took place under the direction of Dr Caldani Professor of Anatomy, and was performed by Dr Fabris, assisted by Dr Argente, assistant to the Professor of the Institutes of Surgery, in the presence of Dr Brugnolo, physician to the Delegation, and Dr Morgagni on the part of the Municipal Health Department. A short history of the disease was first read by Dr Montesanto to his colleagues, after which a statement of the dissection in the form of a *proces verbal* was made, and deposited in the Acts of the Royal Delegation, signed by the professors and other physicians present, many of whom had frequent opportunities of visiting the patient during life, and observing the progress of the disease.

Necroscopic Appearances.—The body was emaciated, especially in the lower part, and it was observed, that the want of nourishment during the last period of the disease had singularly reduced the upper part of the body.

The features were much distorted from the long and severe sufferings before death. The articulations of the knees were flexible; but the feet were strongly extended, forming a direct line with the shin, and could not be bent by any means. The toes of both feet were also immoveably curved and bent, as before-mentioned, having been thus for many years.

On opening the chest, extensive adhesions between the pulmonary and costal pleura on both sides were found, especially in the upper portion of the right lobe.

In the base of the superior lobe of the right lung there was a small cavity, but which did not exhibit any trace of previous disease. The *pericardium* contained a quantity of bloody serum. The heart was rather small; but its cavities, and all the large blood-vessels, were in their natural state. These alterations of structure were evidently the consequences of the inflammatory attacks experienced in 1831, which produced so much difficulty of breathing, and required such frequent blood-lettings.

In the abdomen, the stomach was found much more distended, and larger than usual, and measured from the cardiac *cul de sac* to immediately before the *pylorus* eight inches and a-half Italian, or nine inches three lines Parisian measure; and from the top of the sac to the middle of the larger arch seven inches, or seven inches seven lines of the latter foot. This viscus contained some fecal matter. Its internal coat was sound, as was also that of the *œsophagus*, which is the more surprising, as the patient had been allowed the use of spirituous liquors.

The liver was attached throughout the whole of its upper part, to the concave surface of the diaphragm. The gall-bladder was totally empty of bile, but filled with twenty-five or thirty *calculi* of various sizes, from that of a filbert to a grain of corn.

The *omentum*, less extended than usual, (as if entirely deprived of fat) sent off a bridle, which, passing under the small intestines in two places, attached itself very strongly to the *meso-rectum*.

The external surface of the small intestines was injected in various places, and of a brown-red colour.

Their diameter was contracted here and there, and especially in that part of the *ileum* which is near the *cæcum*. Their internal surface presented also some traces of a colour more or less red, and they contained matter similar to that found in the stomach.

The *cœcum*, the ascending, and part of the transverse arch of the colon were in a natural state, but at the left iliac curvature and the whole of its remaining portion to the *rectum*, the coats were thickened and resistent, with various and extensive very strong adhesions to the neighbouring parts. The internal calibre was very small, and there were frequent ulcerations in the internal membrane itself. These ulcerations were also common to the *rectum*. The whole of the small intestines contained liquid fecal matter, and the large more condensed.

The spleen and pancreas were sound.

The *bladder* was very much shrunk or contracted, lying behind, and indeed quite concealed under the pubis, so that it seemed to be altogether awanting in the cavity of the pelvis. Its parietes were so much thickened, that neither from its very small bulk—its figure—nor the appearance of its coats, had it the least resemblance to the bladder in the natural state. Its cavity, which was only capable of holding three ounces, contained a little reddish turbid urine.

The kidneys were sound; the ureters contracted and flaccid. The urethra was rather of a reddish colour.

The vertebral column presented no alteration in the external form. The cavity of the vertebral column contained a large quantity of bloody serum, and this was found also under the *dura mater*. The vessels of the *pia mater* in the posterior surface of the spinal chord were injected and distended, especially from the third and fourth dorsal *vertebrae* to the beginning of the *cauda equina;* and through the whole of this space, the *medulla spinalis* was very consistent. The colour of the surface, and the dimensions of this important organ and the membranes were natural; but the substance itself appeared, even to the naked eye, red and injected, especially where the consistence was greatest, as was ascertained by a deep incision through the anterior groove of the whole spinal chord.

By the aid of a microscope, Professor Ster discovered subsequently in the internal texture of this part, a singular injection of its more minute vessels. The spinal roots, and spinal nerves themselves (traced for a short space) were not altered.

In the *head*, the *dura mater* appeared œdematous from infiltration of serum under it, as also the arachnoid membrane, which was moreover opaque. The *pia mater* in its convex surface, as well as at the base of the brain, presented a highly injected state. The hemispheres were more consistent than usual. The *cerebellum*, on the contrary, was small and soft, compared with the lateral parts of the hemispheres, which were more developed than the vertical part. Nothing unusual was found in the ventricles of the brain.

Such is the history of this remarkable case, with the pathological state of the parts discovered on dissection. The morbid condition of the *medulla spinalis*, and its investing membranes, with the great and extensive injection of the vessels of those membranes, as well as the whole nervous pulp of the chord itself, were originally occasioned by the fall, the concussion by which produced a susceptibility to morbid action in the injured parts, indicated by the early symptoms, and which terminated in a severe attack of acute *spinitis*, aggravated by the cold of the prison. This morbid state of the spinal chord and its membranes necessarily affected the roots of the spinal nerves, and gave rise to the paraplegic state of the inferior extremities, and suppression of the alvine and urinary evacuations; and as the part of the spinal chord thus affected was in such a state of disorganization as to incapacitate it ever afterwards from transmitting the nervous influence to the parts affected, the morbid condition of those parts was gradually produced that was found after death. The daily vomiting of the food, and afterwards of the occasional fœcal residuum, may be regarded as a proof of the impaired action of the alimentary canal from enfeebled innervation.

It is difficult to reason on the derangement in the functions of the urinary organs. But we perceive, on the one hand, the effects of the morbid process on the bladder, in the contracted state of this viscus, and the indurated thickened condition of its coats, the same state as that of the intestines and other parts, from deficiency of nervous action from the spinal nerves; and on the other we must consider the state of the stomach, its increased activity, its great capacity, and the constant daily act of vomiting, which, if it did not produce a direct absorption from the kidneys themselves, was adequate to prevent materials for their secretion from being conveyed to these glands.

But, although the action of the cerebro-spinal nerves had become so impaired as to prevent them from exercising on the large intestines those functions that belong to sense and motion, exclusively proper to these nerves, the influx, however, of nervous influence continued for their support, which is supplied by the great sympathetic and the ganglions arising from it, "on whose vivifying powers," says Puccinotti, "depend all the functions that relate to the proper preservation of the organic substance;"[*] and according to the experiments and observations of Brachet, "the paralysis of the lower extremities, as in this case, depends on the action of the ganglionic system, whereby a mode of life may be maintained, that would be sufficient to prevent disorganisation, atrophy, or union of the internal parietes;"* and the same will apply to the state of the bladder and rectum, which receive nerves from the spinal branches of the region of the sacrum, and from the inferior part of the great sympathetic. It may be questioned, whether the pathological state of the spinal chord will account for some of the symptoms recorded,—such as the total want of secretion of urine for so many years, the constant vomiting, and absence of fecal evacuation, by the usual passage, for the same period. But if the morbid appearances of this organ be not sufficient to produce these phenomena, it will be difficult, I apprehend, to account for the morbid state of the bladder itself, and rectum, and particularly the immoveable condition of the lower extremities, with the singularly incurvated contracted state of the feet and toes, which I described in my former report of the case, and which I had an opportunity of seeing twice at an interval of two years.

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[*] Lezioni sulle malattie nervose. Firenze, 1834, p. 68.

It has been observed that the constant vomiting might prevent the proper supply of materials for secretion from being conveyed to the kidneys; and this I regard as the most likely mode of accounting for the want of secretion by these organs. But it was remarked, that when the activity of the stomach was impaired, and analogous changes were manifested in the internal condition of the viscera, the secretory organs in some degree recovered their functions. Not only was the liquid secreted scanty, but it was also inodorous and void of alkalescence, as was observed towards the close of life of the patient; and we were induced to suppose that the urinous odour, which had only been detected by a jailor in the contents vomited early in the disease, was concealed in these from the great quantity of water the patient drank before vomiting, and mixed with food, and the spirits he was in the habit of using, and under these circumstances the proper alkalescent odour could not have been ascertained.

Dr Cavalli gives an instance of a woman who lived twenty-eight years with copious vomiting, believed urinous, accompanied with extraordinary phenomena,† from which he infers there is proof of a direct line of communication betwixt the stomach and kidneys.

But the explanation given by Presciani is more in accordance with our case, in the instance of the case of a woman related by Thomas a Viega, who lived twenty years without urinary evacuations;‡ and very similar, also, is the case mentioned by Ollivier at the meeting of the Royal Academy of Medicine at Paris—who, in referring to our case, states that of a patient who lived many more years without urinary evacuation.*

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* Recherches experimentales sur les fonctions du systeme nerveux ganglionaire. Bruxelles, 1834, p. 236.

† Storia ragionata di straordinaria malattia di Carlo Cavalli. Milano, 1834, p. 30 and 31.

‡ Honesta quædem virgo, ante annos viginti, incidit in integram perpetuamque omnis excrementi, et humidi et sicci, retentionem: et cum vivat, sed epilepticis convulsi-

The necroscopic appearances in these cases are not recorded, and they probably would not have demonstrated more than the one now before us;—for we know that in cases analogous, the organ itself has not presented such a change of structure after death, as to account for the irregularity or suspension of function during life.

I may mention an instance in my own experience, of a female to whom I was called by Dr Moncrieff to visit in this neighbourhood, in whom the secretion of urine was occasionally very irregular. This patient was attended constantly by Mr Hunter of Juniper Green, who kept a regular account of the progress of the disorder. It was necessary to use the catheter for many days together, and occasionally there was a total want of the secretion of urine, the kidneys more than once suspending their functions for five weeks. There was no coma, stupor, or vomiting. The patient was very subject to violent spasmodic affections, and, like the case which I have been detailing, there were frequent inflammatory attacks of the organs of respiration, with a tendency to hemorrhagies for many years, from the nose, lungs, uterus, and intestines; and latterly repeated blood-letting was necessary to relieve the urgency of the symptoms.

After death the body was carefully examined; but nothing was found to account for these extraordinary symptoms. There were strong adhesions of the pulmonary and costal *pleuræ*. But the kidneys and other organs were sound.

In concluding this communication, the two following points are to be considered. 1*st*, Whether the facts recorded are sufficiently authenticated; and 2*d*, Whether the appearances found after death, are such as to account for the symptoms during life, according to the usual acknowledged physiological laws.

I formerly stated the circumstances under which this patient was placed, and the difficulty, if not the impossibility, of any imposition being practised by the attendants, whose veracity indeed had never been called in question, either by the Faculty at Padua, who had constant opportunities of observing the progress of the malady—the members of the Royal Academy, before whom reports of the case were successively submitted—or by the local authorities, who received regular official accounts of the patient from Dr Menato physician to the prison, who depended on the government for his appointment. I may now

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onibus crebro correpta, in totum mingendi et dejicendi munere privata est; sed exiguum alimentum sumens, per os crebro rejicit."—Thom. a Viega Com. cap. ii. lib. 6. Galeni de locis affectis.

[*] Archives generales de Medicine, p. Fevrier 1833, p. 302.

add, that we cannot conceive any motive whatever for deception in such a case; for the helpless condition of the patient, from the long paraplegic state of the inferior extremities, which was obvious to every one who had an opportunity of visiting him, must have prevented him from enjoying his liberty had he thus obtained it; while his companions in crime, who were in equally rigorous confinement, did not attempt to practice any deception in this way for their liberation.

In regard to the necroscopic appearances, admitting that such an extent of organic disease was not discovered on dissection, as might *a priori* have been expected, still we know that in analogous cases, as I have already observed, very little or no disorganisation has often been found, where functional derangement to a great extent, and for a long period, had existed during life. The appearances seemed further to indicate chiefly an affection of the membranous envelopes of the spinal chord; and we know from many analogous cases, that mere vascular distension of these membranes, if long-continued or maintained by adequate causes, is quite competent to induce, first the peculiar contractile motions in the flexor muscles, with loss of power in the extensors, observed in the lower extremities of Valetto, and then the loss of power in other parts. It appears to me further, that a similar deranged action might be induced in the splanchnic nerves, and their renal plexus, from the irritation propagated from the roots of the spinal connections of that nerve, and that we are thus to explain the occasional deranged secretion of the kidneys, and the concomitant deranged action of the stomach, and the impaired powers of the whole alimentary canal.

We find, moreover, if we credit the cases already quoted, and especially that recorded by Thomas a Viega, that this is not the only instance of such remarkable phenomena to be found in medical history; and if we rely, therefore, on the accuracy of these cases, and of that now before us, we shall come to the conclusion, that in these phenomena, we perceive the conservative effect of those organic laws, by which every thing is done to ward off the approach of dissolution;—so that while in one part the regular progress of the proper functions of this or that system or viscus is disturbed or perish, in another the means of resource or compensation are found to develope themselves,[*] the law appearing to be, according to Buffalini, the more the nervous action in any one part languishes, so much the more is the absorbent increased in another; which facts go to explain the *poteri fisiologici superstiti* taught by Puccinotti.

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[*] Storia di un tetano reumatico &c. inserta nel Giornale per servire ai progressi della Patologia. Venezia, Fascic. iii. p. 444. Decembre 1834

PART II.

CRITICAL ANALYSIS.

Art. I.—*Observationes Anatomico-Pathologici et Practici Argumenti*, Auctore, J. L. C. Schroeder van der Kolk, Med. et Art. Obst. Doct. Medico in Nosocomio Amstelodamensi Suburbano. Fasciculus I., cum 3 Tabulis Lithographicis. Amstelodami, 1826. 8vo.

In the subsequent part of the volume of M. Schroeder van der Kolk, the examination of which we now resume, the author treats of a particular species of bronchial inflammation which is chronic, and gives rise to dropsical effusion, of hydrothorax, and of gangrene of the lungs.

I. Besides the ordinary chronic bronchial inflammation which constitutes the pituitous consumption of foreign nosologists, M. Schroeder van der Kolk distinguishes another form of the disease, in which the leading symptoms are asthmatic. The *dyspnœa* is urgent, the face is reddish-blue, the lips are blue, sometimes black, the hands, especially the nails, are livid, and to these are sometimes added symptoms of dropsy; while the countenance so much resembles the blue disease, that he allows that in the beginning of his practice he was deceived. The case was the following.

A female, aged 27, of plethoric habit, but swelled with general dropsy, was put under his care, with the greatest anxiety at the breast, continual visible palpitation, intermittent pulse, a reddish-blue tint of the cheeks, livescence of the lips, a reddish-brown colour of the sclerotic, with many reddish-brown veins, and especially blueness of the nails. She stated that from early youth she had been subject to palpitation, and she had learnt from her parents, that from her first year she had been distressed with the disease; but the blue colour had appeared only the previous year, or at least it had only attained that stage, when dropsy suddenly supervened. Menstruation was natural till the latter months of the disease. M. Schroeder van der Kolk, though uncertain whether to ascribe these symptoms to diseased heart or diseased lungs, was more inclined to the former view; but looking chiefly to the dropsical symptoms, he prescribed foxglove, soluble tartar, and similar diuretics.

The patient died in a few days, and dissection presented the following appearances.

The heart was natural, unless in the right ventricle being a little larger than proper. Neither was the *foramen ovale*, or the duct of Botallus open, nor did the origin of the large vessels, shew any thing abnormal; but all the vessels, and especially the veins, were distended with dark-coloured venous blood. The lungs did not collapse, and were red-coloured, as if turgid from congestion. At length, upon cutting open the windpipe, he found the mucous membrane at least one line thick and internally red; and these appearances extended through all the bronchial tubes.

This thickening of the mucous membrane, the author infers, prevents the admission of air, and consequently due oxydation of the blood, thus rendering the whole of that fluid venous. The circulation through the lungs is at the same time impeded, whereby these organs are swelled and distended by blood, and great anxiety, *dyspnœa* and palpitation are induced. Afterwards he found in other cases the heart, especially the right ventricle, of great size, and the valves of the pulmonary artery stained with a red tint, which no washing could remove. Always a quantity of *serum*, larger or smaller, was found in the chest, evidently by the difficult transition of blood through the lungs. Constant congestion towards the head took place, which at length was so great as to induce delirium, and even mania. In one case he succeeded not only in curing a case of mania of this kind, but also the bronchial inflammation itself, by the repeated application of leeches to the chest and the use of cold cloths to the head, so that the patient was cured of all disease in the chest.

The most characteristic and pathognomonic symptom of the disease he regards as the sclerotic tinged with deep red vessels; and to this are added livescence of the lips, blueness of the cheeks, redness of the face, and blueness of the hands, with dropsy more or less general.

In no disease are effects more beneficial produced by the application of only three or four leeches even, than in this, so that by the antiphlogistic diuretic method alone, and the repeated application of leeches, it is not uncommon for the disease to be subdued; because, by the venous character of the blood, and its congestion in the skin, the discharge continues so long after their application as to the second day, and sometimes even a fresh hemorrhage takes place twenty-four hours after from one of the wounds. He has rarely employed general blood-letting, unless there were great anxiety and congestion of the lungs; for it produces much less relief in this disease, though more blood may be discharged.

After the application of the leeches the congestion towards the head was always abated, the sclerotic recovered its natural whiteness, or at least became much less red, the respiration was more free, and the blue colour of the lips gave place to redness. The obstinacy of the disease nevertheless may sometimes demand the repeated application of leeches.

The occurrence of dropsy after this disease is easily understood. In the serous membranes, as the *pleura*, *peritonæum*, &c. which discharge *serum* to lubricate their surfaces; if from any cause congestion of the small vessels and orgasm, or a sub-inflammatory state take place, the secretion of these membranes is augmented, that is dropsy arises; but if, as was stated in the introductory observations, the inflammation reach that stage, that the texture of the membrane is changed, the secretion is also changed,—in other words coagulable lymph or purulent matter is formed.

As the diminution of the congestion, however, diminishes the inordinate secretion of serous fluid, M. Schroeder van der Kolk infers, that the hydrothoracic effusion in this disease may be most successfully overcome by the application of leeches. He believes also, that in this state congestion appears to give rise to spasm of the vessels, impeding absorption and renal secretion; as the urine, which is previously red and scanty, becomes often spontaneously abundant after the application of leeches.

In cases of great congestion, he further observes, foxglove was not always beneficial, but aggravated the anxiety and difficulty of breathing, increased the congestion towards the head, and by retarding and enfeebling the contractions of the heart, impeded in a greater degree the already difficult circulation, rendering the heart unable to overcome the obstacles of the circulation. In the course of the disease, however, by removing phlogosis, it often proved an excellent remedy. The remedies most useful in this species of *bronchitis* were nitrous medicines, acetate of potass, soluble tartar (tartrate of potass,) oxymel of meadow saffron, which he has found superior to oxymel of squill, with mucilaginous and antispasmodic medicines, among which he specifies extract of henbane and Dover's powder.

In illustration of the beneficial influence of the mode of treatment now specified, he mentions the circumstances of three cases.

In the first, a female, who was still under treatment, difficult breathing, with palpitation and congestion towards the head, were so intense that there was the utmost peril of suffocation. Speech was almost impracticable by the anxiety in the chest; the lips were blackish; the sclerotic swelled with brownish vessels; the feet œdematous, and the hands bluish; and the urine was scanty and reddish. Under this disease she had suffered for years. The application of leeches was followed by remarkable alleviation, and the urine, which had resisted all the refrigerant diuretic remedies, became next night much more copious. The same symptoms recurred three times, though with less intensity; but on the application of three or four leeches, which discharged a large quantity of blood, and by the continued use of diuretics, the blue colour entirely disappeared, the respiration became unembarrassed, cough subsided, and œdema went off, so that, if the strength were gradually restored, she would be able to quit the hospital.

In the second case the benefit was still more conspicuous. A woman, 44 years of age, who had been asthmatic from infancy, and afterwards occupied in hard labour, was gradually affected with increasing anxiety in the chest, which at length, in the month of November 1824, obliged her to enter the hospital. Her breathing was then laborious and anxious, the face red, the sclerotic tinged with turgid blood-vessels, the pulse frequent, small, and irregular, headach intense, the tongue dry, the thirst great, the belly slow, the urine red and scanty, and the skin dry. After evacuation of the bowels, venesection was performed, the blood presenting a buffy crust, and emollient antispasmodic nitrous medicines were exhibited; and though next day the anxiety was aggravated and the pulse irregular, yet, by persevering in the use of the remedies from the 20th to the 26th of November, the symptoms declined so much, that the respiration was relieved, the eyes less red, and the pulse slower. The symptoms, however, again becoming aggravated, three leeches were applied to the chest, with the effect of relieving the breathing so much, that the patient could lie on the back; the pulse was more regular, the sclerotic white, and the secretion of urine was more copious. The strength increased daily; occasional palpitation was alleviated by means of foxglove; a large deep inspiration did not induce coughing; and the patient began to take exercise. This state of symptoms continued till the 11th December, when exposure to cold was followed by a fresh aggravation. The discharge occasioned by the application of four leeches, however, to the chest, was followed by so remarkable improvement, that in a few days no disorder of respiration was observed, and the patient, being able to ascend a staircase without inconvenience, left the hospital well.

In a third case, a young woman of 20 years, with anxiety at the breast so intense, that the lips were black, the cheeks deep blue, the sclerotics brown with turgid veins, and the respiration panting;—was, by the means now mentioned, delivered from all disorder of the chest, but was obliged to remain long in the hospital for the debility which succeeded the disease.

The peculiar form of *bronchitis* now described, and its tendency to induce dropsical effusion within the chest and in the general cellular tissue, have been noticed by other observers. We may here refer to a Clinical report, published in the forty-first volume of this Journal, (p. 83–85,) in which the symptoms during life and the appearances of the bronchial membrane and lungs after death are described. It may be also proper to add, that this description had been derived from cases observed and treated by the author of that Report, and before he was aware of the observations made by Dr Schroeder van der Kolk. In other respects the descriptions afford mutual confirmations of the accuracy of each.

II. The description now given, shows the close alliance between the species of bronchial inflammation and *hydrothorax*; and the author passes, therefore, from the consideration of the former, to that of the latter malady, the more readily, that it is almost endemial in Amsterdam, and there, as in other places, extremely difficult to cure.

The doctrine, that dropsy in general is often a disease inflammatory in its origin and nature, was first admitted by Cruickshank, Parry, Baillie, and Pemberton. The influence of inflammation as a cause of dropsy, was afterwards maintained by Grapengiesser of Göttingen, and Rush of Philadelphia, and has since been established by the researches of Wells, Blackall, Crampton, and Ayre. The facts adduced by these authors afford sufficient evidence, that anasarca generally, and all the dropsical effusions into the cavities of the serous membranes, often originate, not as was taught by Cullen and others, in debility and obstruction, but in inflammation of these membranes, and that dropsical effusion is frequently one of the effects of that inflammation. The present author, though he does not appear to allow the direct influence of inflammation of the serous membranes in inducing serous effusion into their cavities, admits their indirect influence as a result of inflammation of some of the component tissues of which the organs consist.

He begins by adverting to the frequency of sudden and unexpected death in this disease, in cases in which he never anticipated that life was in immediate danger; and though he has anxiously sought for an explanation of this phenomenon, he allows that the solution of the question is not easy. He maintains, in the first place, that the explanation given by various authors, —that death is the result of suffocation, induced by serum in the chest compressing the lungs, is totally inadmissible. After making several inspections, that he might be certain as to the previous symptoms of dropsy of the chest, he found, indeed, more or less serous fluid in the *pleura*, but not so much as to compress the lungs, and prevent them from performing their duty, or impede the access of air to the blood; and conversely, he saw the lungs much more compressed, yet without inducing suffocation. In proof of this he states, that he has a specimen of extensive *pericarditis*, in which the pericardium was so much expanded with purulent matter, that it not only covered both lungs, but compressed them against the back, occupying almost the whole cavity of the chest. In this case, however, life was long protracted, and the patient died slowly. In another case of pleurisy from a wound of the chest, such a quantity of purulent matter was effused into the left cavity of the chest, as to thrust the heart to the right side, so that when it was removed the aorta and œsophagus were exposed, the left lung being almost entirely compressed and destroyed; and yet the patient lived long. He further remarks, that it is impossible to imagine so great a quantity of serum to be collected in a single instant within the chest, as to compress the lungs so quickly and cause immediate death. Lastly, he adds, that in the bodies of those who died suddenly from *hydrothorax* he did not find a larger quantity, often he found a smaller, amount in the chest, than in those who died slowly.

These circumstances led M. Schroeder van der Kolk to inquire, whether morbid anatomy could throw any light upon the cause of death.

Like Laennec and others, he attempted first to trace the cause of this sudden dissolution to ossification or other disease in the valves of the heart, which he had often found so affected in cases of hydrothorax. Further inquiry, however, showed that often there was no morbid affection of the valves, in cases in which the individuals were unexpectedly cut off by dropsy of the chest.

He next thought that the cause of the fatal event was to be found in the lungs themselves, an opinion which was in some degree confirmed by the observation of Dr Hastings, who had seen hydrothorax arise from bronchial inflammation; and in point of fact he found, in all the persons of those cut off by *hydrothorax*, that the lungs, though in external appearance very sound, were yet internally much diseased, their air-cells filled with serous fluid, and scarcely a particle of air issuing from them; the bronchial tubes more or less filled with red, frothy, generally brownish-coloured serum, sometimes in such quantity that it was wonderful that the patient could still inspire. The bronchial mucous membrane, particularly on the smaller tubes, sometimes even in the larynx itself, was more or less reddened, and presented marks of inflammation. Hence such lungs, when the chest is exposed, do not collapse. The blood-vessels, especially the pulmonary artery, were distended with blood and polypous coagula; the right ventricle of the heart was distended and filled with similar clots. In the brain he found no trace of apoplexy.

From these facts, the author infers that the right chamber of the heart is distended with blood, by the interrupted circulation through the lungs, and hence the frequent palpitations; while by the profuse effusion of serum, the air is scarcely allowed to enter the vesicles of the lungs,—a circumstance from which he thinks it likely that the effusion produces sudden palsy of the lungs, or that the interrupted circulation renders the heart unable to distribute the blood; especially since such patients expire at the effort of moving the bowels.

Nor is this the only cause of the sudden fatality of hydrothorax. Not unfrequently, especially in young subjects, convulsions ensue, particularly if the face be swelled and œdematous; and these convulsions often precede death by a day or two, with intervals, however, of tranquillity, such as to give hopes of recovery, until *coma* ensues. In the bodies of such persons, M. Schroeder van der Kolk, besides the appearances already mentioned, generally found a large quantity of serous fluid between the spinal marrow and its *dura mater*, or between the arachnoid membrane and the *pia mater*, or between the *dura mater* and arachnoid, or in both situations; and in some instances the lateral ventricles were filled with fluid. In general, also, he found shreds and filaments of pseudo-membrane, connecting the arachnoid membrane to the *dura mater*,—all indications of meningeal or arachnoid inflammation.

In other instances, however, as in one of a girl referred to by the author, who fell a victim to hydrothorax, no serous fluid was found between the membranes; but the *dura mater* and *pia mater* being uniformly reddened, showed that the inflammation, though it had not induced effusion, was nevertheless present. In this case, in which the convulsions had gone off, and the patient recovered sufficiently to walk about, but returned violently, the brain was sound; and the author infers, that the sympathy which exists between the serous membranes produced secondary *arachnitis*, with irritation of the spinal marrow. He acknowledges, however, that it is wonderful that the convulsions in this instance should undergo so evident a remission, and then return and terminate fatally.

From the facts furnished by all his dissections, in short, he concludes, that in hydrothorax the lungs are the diseased organs; that irritation of their mucous membrane proceeds sometimes to chronic inflammation; that the circulation through them being impeded, causes orgasm and congestion, though the inflammation does not attain that degree of intensity to thicken the membrane and impede respiration; and that the irritation and congestion cause an increased and perverted secretion of serum from the bronchial membrane into the pulmonic vesicles, and from the surface of the *pleura* into its cavity.

He further takes care to add, that while it is clear that the effusion of serum into the thoracic cavity is caused by augmented secretion from the pleura, this is the effect of the disease, and constitutes neither the disease itself nor its cause.

Dropsy, he further thinks, seldom arises from debility; for many inspections have shown him that generally traces of chronic inflammation, more or less considerable, are found in the serous membranes. In *Hydrorachitis*, or dropsy of the spinal marrow, the arachnoid membrane is covered with pseudo-membranous filaments; in dropsy of the cerebral arachnoid membrane, the texture of the latter is thickened; and in ascites the *peritoneum* very often presents marks of inflammation, in adhesion of the liver to the diaphragm, or the *omentum* being loaded with black spots and vascular patches, and occasionally, in old cases of the disease, in adhesion of the intestines and the presence of lymph and puriform fluid. He mentions also, that he has sometimes found in the *peritoneum* innumerable pustules, like a miliary eruption, principally where the mesentery begins to cover the intestines, and chiefly if, during life, there had long been chronic itch, with a dry rough state of the skin, and that these pustules were shown by injection to be connected with the lymphatic vessels.

It is further remarkable, that in dropsy he states that he has never found the kidneys diseased. These glands are, in the cases of dropsy current in this city, very often mottled, marbled, of a yellowish colour, tuberculated, or otherwise most seriously changed in their cortical structure.

Under the head of *Diagnosis* we find some correct and useful observations on the characteristic symptoms, and the causes on which they depend.

Pale *œdema* of the lower eyelids, especially if accompanied with *œdema* of the feet, he regards as so constant a symptom, that, from the countenance alone, he could almost always recognise the disease without chance of being mistaken. Cough is not very incommodious; but several patients complain of the tightness and oppression of the chest, and inability to lie on the back, which symptoms he ascribes to congestion and impeded circulation in the lungs. The symptoms of *orthopnœa* and sudden starting from sleep, he finds to be more uniform in young subjects, and to be often wanting in aged emaciated persons; and to this are added not unfrequently palpitation, often irregular pulse, which becomes freer and fuller during a deep inspiration, but sometimes fails entirely in expiration. This we have often seen, and believe that the explanation here partially given is the correct one, namely, that the circulation through the lungs is impeded in expiration, and consequently the blood is temporarily prevented from entering either the left auricle or left ventricle, or quitting the right ventricle.

The sense of constriction and anxiety in an intense degree, denote, he conceives, the presence of bronchial inflammation; and violent palpitation indicates dropsy of the *pericardium*.

This disease, the author has observed in Amsterdam in the course of autumn and the beginning of winter. Sometimes it is the result of obstinate agues, in which case *ascites* and diseases of the spleen or liver are present.

In accordance with the pathological principles now established, M. Schroeder van der Kolk conducts his therapeutic measures. As the disease is very rarely the result of debility, and is most frequently the effect of inflammatory action, he first subdues this by means of local depletion from the chest, by leeches or cupping, and the evacuating power of tartar emetic in minute doses, with laxatives and purgatives. Local depletion, by the application of leeches, he finds, not only greatly relieves the anxious panting and difficult respiration, but is almost uniformly the most certain means of exciting and promoting the flow of urine, when diuretic medicines are completely inefficient. If after local depletion the urine continue red, muddy, thick, and scanty, then, upon the idea that the alimentary organs are loaded with impurities (*sordes*,) or bile, tartar emetic in minute doses, or purgatives are administered, after which the secretion of urine begins to be augmented. In certain cases in which spasm appears to repress the urinary secretion, antispasmodic agents, as henbane, water of bitter almonds, or foxglove, become the appropriate remedies.

After these preliminary indications have been fulfilled, M. Schroeder van der Kolk gives diuretics; and, among these, he assigns the preference to those which possess antiphlogistic properties, or, in other words, have the effect of abating inflammation. Such are soluble tartar, that is tartrate of potass, acetate of potass, nitrate of potass, foxglove, as also oxymel of meadow saffron. Tonics and the bitter astringents he condemns, in consequence of their inducing tightness in the chest, and diminishing the flow of urine; but if the patient be very feeble, he allows occasionally infusion of valerian or leopard's-bane (*Arnica montana*,) to be added to the diuretic medicines. But these he uses cautiously, and above all, he regards it as important to regulate well the actions of the alimentary canal, and, by means of cathartics, to prevent accumulation and unhealthy secretion. In illustration of the efficacy of those therapeutic principles he details the circumstances of seven cases.

The first case, he allows, was the one which principally showed him the beneficial influence of the kind of treatment now mentioned.

1. A woman, aged 59, of delicate constitution, was received into the hospital, with great constriction of the chest and palpitation, much aggravated by motion, obstinate cough, lasting for a year and a-half, and constant hawking, difficulty of lying on the back, difficult breathing, occasional œdema of the feet, irregular, intermitting pulse, reddening of the cheeks, and œdematous swelling of the lower eyelids. The physician had suspected a vomica of the lungs; and under the influence of his authority, M. Schroeder van der Kolk ordered almond emulsion with extract of *hyoscyamus*, and next day four leeches to be applied to the breast. On the third day the patient felt herself much relieved, and could lie on the back, while the pulse became regular, and the urine copious. This led the author to think that he had committed a mistake in diagnosis, and by adding foxglove to the other diuretics, he promoted the urinary secretion to such extent, that the patient after some time left the hospital, perfectly cured of all complaint of the chest.

2. A young man of 17, labouring under *ascites* and *œdema of* the *scrotum*, and presenting undoubted symptoms of dropsy of the breast, was brought into the hospital on the 24th May 1824, with scanty urine, yet without fever or pain of the hypochondriac regions. He was ordered a diuretic mixture of soluble tartar, and oxymel of meadow saffron, with some powders of foxglove, which had the effect of augmenting the urinary secretion. Ten days thereafter, however, gastric symptoms indicated their existence, by yellow loaded tongue, bitter taste in the mouth, diarrhœa, and a very scanty secretion of brown-coloured urine. These were abated by the use of resolvents, emollients, and muriate of ammonia; but again palpitation, irregular pulse, with cough, *orthopnœa*, and swelling of the lower eyelids recurred; and excoriation of the *scrotum* having taken place, a large quantity of serum escaped with beginning detumesence of the abdomen. At this time infusion of the flowers of leopard's-bane (*Arnica,*) with acetate of potass and foxglove, was tried; and under their use the belly continued to decline in size, with good, though not copious secretion of urine. Palpitation, however, with anxiety in breathing, increased so much that Dover's powder was given with the first diuretic mixture, while the leopard's-bane infusion was stopped. All the symptoms were again aggravated so much, that on the 24th June, when the urine was extremely scanty, the palpitation most violent, and the anxiety in breathing most distressing, with irregular intermittent pulse, M. Schroeder van der Kolk applied four leeches to the breast, and administered the acetate of potass and foxglove.

On the 27th, three days after the bleeding by the leeches, the oppression at the breast and the anxious breathing were removed, the pulse was regular, and a large quantity of urine had been passed during the night; and by the continued use of the remedies, the patient left the hospital on the 10th of July, free from all dropsical effusion and complaint in the chest.

3. A young woman, 24 years of age, previously healthy, in consequence of neglected catarrh in March 1825, laboured under cough till May, when she presented symptoms of quotidian fever, with pain through the whole breast, cough aggravated in the paroxysm, difficulty of breathing, and cessation of the *catamenia*. The febrile symptoms abated in the course of eight days, but left the asthmatic in unabated intensity, with orthopnœa, disturbed sleep or *pervigilium*, and so scanty secretion of urine, that for 24 or 36 hours scarcely a drop was discharged. On the 11th November symptoms of tertian ague appeared, with pain in the chest, but particularly severe in the right side, swelling of the feet, and oppression of the chest, so intense that he was obliged on the 22d to enter the hospital. At this time, besides the dropsical symptoms, the tongue was loaded with a yellow fur, the taste was bitter, the urine was scanty and red, there was slight pain in the region of the liver, and the right side of the chest, and short respiration preventing the patient from lying on his back. A mixture of acetate of potass and emetic tartar was ordered, with the effect of removing the gastric symptoms in seven days; but without increasing the urinary secretion or alleviating the difficult respiration, and with this intention the diuretic mixture of soluble tartar, (tartrate of potass) with oxymel of meadow saffron, and extract of henbane was given. The fever meanwhile continued every second day, sometimes with severe headach; and as the urinary secretion was not increased, a quantity of blood was drawn from the chest by cupping. This was followed by great relief from the breast, change of the pulse from small and oppressed to full, a copious flow of urine the ensuing night, facility of respiration, and abatement of the *œdema* of the face. The *Cephalaea*, however, continued, and being associated on the 6th, with fainting and convulsions, was opposed by cold affusion and local bleeding by means of leeches from the temples, while the fever finally gave way to sulphate of quinine and magistery of bismuth. All symptoms of disease of the breast were gone on the 16th; and though epileptic convulsions returned some time afterwards, there were no symptoms of dropsy.

4. In this case, which occurred in the person of a man of 50 years, though the symptoms underwent a temporary improvement in consequence of three leeches applied to the chest, and which are represented to have drawn a large quantity of blood, they recurred in an aggravated shape in consequence of mental distress, and terminated the existence of the patient.

5. A girl of 16, with symptoms of hydrothorax, and general dropsy of more than two months duration, and complicated with squeamishness and vomiting, and other gastric symptoms, was admitted into the Amsterdam hospital on the 26th January 1826. The gastric symptoms were first mitigated by laxatives and tartar emetic; and as headach, dilated pupil, and pain of the breast, with hard frequent pulse came on on the 29th, blood was drawn from the chest by cupping.

At two next morning violent epileptic convulsions, with foaming at the mouth and congestion in the head, took place, for two hours, upon which blood was again taken from the chest by cupping, with the effect of immediately, it is said, diminishing the convulsions. As the pupil was still dilated, however, and the breathing was anxious, another cupping was performed at the breast on the 30th; and the same night much urine was passed, and the patient could lie more easily on the back. There was still, however, pain of the breast, with cough and bloody expectoration, the pulse was something hard, and the pupil was dilated, with slight giddiness. As the expectoration continued to be streaked with blood, and the mouth gave a bitter taste, the mixture, with acetate of potass and emetic tartar was resumed, and more blood was drawn from the chest by cupping, with remarkable alleviation of the pectoral symptoms, while the headach was diminished by the occurrence of spontaneous epistaxis; and in a few days the patient left the hospital quite restored.

In this, as in the former cases, the author justly remarks, that the symptoms of inflammatory action were very manifest both in the head and chest, and the urine did not increase in quantity or become natural in quality, till these inflammatory symptoms were subdued by suitable depletion, after which it began to flow spontaneously in abundance.

In some instances, even these symptoms of congestion and inflammation may be so intense and general, as to demand the use of general blood-letting; and of this he gives the following example.

6. A young man, 24 years of age, robust, strong, plethoric, and short-necked, had complained for some time of headach, vertigo, and some stomach ailments, to which not long after were added symptoms of dropsy. On the 10th February 1825, when admitted, the face was pale and void of expression, the lower eyelids swelled, the pupil was dilated, the respiration, panting and uneasy, impeding lying on the back, the pulse hard and frequent, the tongue covered with a yellow fur, appetite gone, bowels slow, the urine scanty and sedimentous, the skin dry and swelled, and the feet œdematous. Resolvents with diuretics made no impression on the urine; and after three days, violent convulsions arose in the night, and next morning the eyes were fixed, the pupils dilated, the tongue red and swelled, and discharging blood from a wound caused by compression between the teeth, the pulse hard and frequent, the bowels unmoved, and the urine scanty. A general blood-letting was directed. After six ounces were drawn from the arm, the convulsions became less violent; and when ten were drawn, the congestion diminished, the pulse became less frequent, and the respiration was less embarrassed. Cold lotions were applied to the head, and blisters to the nape of the neck and calves.

The whole of that night (13th,) the symptoms of oppressed brain and lungs continued; but next day there was slight improvement in the eyes being more animated, without dilatation of the pupils, the pulse slower and softer, and the patient when called by name being capable of raising his eyes and seeing. A scruple of musk in powder was given by the mouth, and a purgative enema with four grains of tartar emetic was administered, which was followed by a copious fetid evacuation; and while stertorous somnolence was followed by calm sleep, without return of the convulsions, the swelling of the tongue abated in the course of the evening of the 15th, so much, that the patient was able to draw it within the mouth, and the urine began to be expelled by the effort of the will. In two days more he was able to walk about, the urine was discharged copiously, the appetite returned, all the symptoms of dropsy having disappeared; and though the wound of the tongue kept him some time in the hospital, he left it on the 25th of February, free from dropsy, and all uneasiness in breathing.

In October he returned with symptoms of rheumatism, which, however, yielded to appropriate remedies, while neither dropsy nor convulsions appeared.

In this case the author attached much importance to the antispasmodic powers of musk, the beneficial effects of which, after controlling the excessive affection of the vascular system by means of venesection, he says he has often witnessed even in cases in which the spinal marrow was compressed by a foreign body. But he farther maintains, that it should be given in a large dose. The following case he gives as one in which it was requisite to combine the stimulant properties of musk and camphor with moderate depletion, in order to avert the fatal termination of a case almost moribund.

7. A man, aged 32, a painter by occupation, of robust constitution, but dissolute habits, after being for some time in a shop in which sugar of lead was manufactured, was attacked with bad lead colic, with obstinate constipation. After persistence of the pains for two weeks, with *meteorismus* of the belly, the bowels were at length opened by drastic purgatives, administered by the medical attendant; but fever with profuse sweatings ensued, and continued for two months, when recovery began to take place. This, however, was only temporary. In the course of two weeks the same symptoms returned, and obliged him to enter the hospital on the 22d November 1824.

At this time the leading symptoms were pain in the left hypochondriac region, dry yellow-furred tongue, want of appetite, slow belly, pale countenance, with daily fever and profuse sweating. For these the sulphate of quinine was given before the paroxysm, to the extent of eight grains; and in a few days the fit was stopped, and the patient felt so well, that he left the hospital well, though against orders, on the 29th of January 1825. In the course of eight days, the symptoms returned, with the addition of a sense of anxiety within the breast, *ascites*, and œdematous swelling of the feet, symptoms for which he again entered on the 10th of March.

A new order of symptoms had now appeared in œdematous swelling of the face and lower eyelids, white foul coating of the tongue, with bitter taste in the mouth, tense hard swelling of the abdomen and left hypochondriac region in the site of the spleen, which further bore pressure badly, uneasy anxious breathing, rendering the supine position difficult, and hard small pulse. Next day, 11th, at half past four, the state of the patient seemed desperate, in aggravation of all the symptoms, loss of consciousness, collapse of the eyes, half shutting of the eyelids, retroflexion of the head, feeble interrupted respiration, dropping of the jaw, coldness, blueness, and powerlessness of the extremities, imperceptibility of the pulse, and languid but tumultuous action of the heart.

The measure of allowing water to drop on the epigastric region from a height of seven or eight feet was employed, with the effect of producing some panting respirations and sobs, contractions of the muscles of the face, and painful rolling of the eyes. The measure was continued a little longer, when motion in the arms returned, and respiration became more frequent and more regular. The instillation of water was now alternated with active frictions, by means of camphorated spirits and tincture of cantharides, when the hands resumed their natural colour, and the pulse began to be felt. The dropping of water was renewed, and the calves of the legs were at the same time strongly rubbed with brushes, the uneasy sensation from which was followed by symptoms of consciousness, and the patient complaining, though in a feeble voice, of intolerable pain in the left hypochondriac region.

Though it was extremely difficult to determine the nature or degree of this pain, yet as it seemed to indicate some form of inflammation, the author thought depletion indicated; but as the strength of the patient could admit only a very small degree of this, he applied a single leech, and administered ten grains of musk, and an equal quantity of camphor. After some blood had been drawn, the patient allowed that the pain was abated, the pulse had become regular and fuller, and he was able to take the powders, and was conscious. He had no recollection of the dropping of the cold water on the epigastric region, nor of the frictions.

The night afforded some hours of placid sleep. But as the pain of the left hypochondriac region was still felt, two leeches were applied, and the antispasmodic diuretic mixture was administered. The pain was slowly alleviated and removed, and the urine was secreted more copiously, with detumescence of the face and belly. Some cough was first opposed by Dover's powder alone, and then by Dover's powder and the magistery of bismuth. The symptoms now gradually declined, and the patient left the hospital well, on the 6th of April.

It is proper to mention, that the author employs the magistery of bismuth, which is a dinitrate, without sulphate of quinine, for the purpose of subduing by its antispasmodic or tonic powers, the symptoms of masked or disguised agues, in which he assures us, he has been with this agent singularly successful, when the symptoms were such that he could not yet use the sulphate of quinine. He adds, however, that unless the sulphate of quinine be repeatedly given afterwards in large doses, such masked ague very readily passes into regular intermittent fever.

Among the diuretic agents which he conceives entitled to particular attention, he specifies the tincture of iodine, the diuretic properties of which he believes are mentioned by no one previously. In dropsy of the breast, indeed, he allows that it may be too irritating; but in that of the belly, he conceives it is both appropriate and efficient, from the phenomena of several cases.

In one of these occurring in a woman aged 56, hard watery swelling of the belly, with pain in the right hypochondriac region and site of the right scapula, was followed by gradually increasing jaundice. After the bowels had been emptied by means of resolvent remedies and glysters, and the tongue had been rendered clean, with the view of diminishing the hard swelling of the abdomen, he added to the diuretic mixture eight drops of tincture of iodine daily. After the lapse of three days the yellow tint of the skin was evidently less deep, the secretion of urine was augmented, the belly was softer and less distended; and on the 15th of December, all jaundice was gone; the hardness and swelling of the belly had disappeared; and in a month after she left the hospital well.

In other cases of dropsy, M. Schroeder van der Kolk has observed, that if there were no traces of inflammation, yet diuresis could by means be augmented, while the cause of the obstinacy consisted neither in plethora, nor in *sordes* of the first passages, nor in spasm, yet a cure was accomplished by the use of iodine.

Thus, in a young man of 28, labouring for two months under *ascites* and *anasarca*, to whom diuretics had been unavailingly administered, and in whom they had produced watery *diarrhœa* with much feebleness, after stopping the diarrhœa by suitable remedies, the tincture of iodine was given with the effect of increasing next day the urinary secretion; and in seven days thereafter he left the hospital free from every symptom of dropsy.

A young woman of 28 was brought to the hospital in October 1822, with symptoms of *ascites* and anasarca of four years duration, with dry, harsh, almost brown skin, scanty urinary secretion, and emaciation. To the diuretic mixture of tartrate of potass, and oxymel of meadow saffron, was added the hot bath, after the action of which on the skin the urinary secretion began to be increased, so that the complexion became more healthy, and the anasarca disappeared entirely. As the swelling of the belly, however, with hardness of the hypochondriac region, continued undiminished, and diuretics appeared to make no further impression, tincture of iodine was prescribed on the 2d of August, at the rate of ten drops twice daily. Ten days afterwards the quantity of urine was very much augmented. Four days after the belly was much reduced in size; in the course of four days more the *catamenia*, which had been long absent, returned; and after two months use, of the medicine, though some swelling still remained, yet all hardness was gone, and the patient, who was able to resume her duties, discontinued the use of the remedies.

From this case M. Schroeder van der Kolk infers, that though the exhibition of iodine was not adequate entirely to restore the patient's health, yet it shewed very decided diuretic powers. He recommends it, nevertheless, to be administered with prudence and caution,—an advice by no means superfluous in the exhibition of this energetic medicine.

The foregoing cases with the remarks upon them we give in an abridged form, though as faithfully as possible, that readers may be enabled to judge for themselves of the justice of the views entertained by the author. This would render all comment by us if not unseasonable at least superfluous. We feel, however, that upon a subject so important, both in a pathological and therapeutic sense, it would be wrong to withhold certain reflections to which the perusal of these cases has given rise.

We observe, in the *first* place, that though these cases are interesting and instructive, they are not, according to our view of the disease, pure instances of water in the chest, either idiopathic or symptomatic; or to speak more correctly, they cannot be regarded as instances of the most usual forms of dropsy of the thoracic serous membranes. Idiopathic *hydrothorax* is so rare a disease, that it has been estimated by a very competent judge to take place in not more than 1 among 1000 cases. Symptomatic *hydrothorax* is a much more common affection, and is the natural termination of almost every organic disease of the heart, large vessels, and lungs.

Secondly, Pathologically speaking, however, every species of dropsy in general, and every case of hydrothorax in particular, may be distinguished as it proceeds from one of two orders of causes. The first class of causes are those which may be regarded as mechanical, and includes all those which tend to impede the free circulation of the blood from the large vessels to the capillaries, and thence backwards to the veins. Of this kind are all diseases of the valves, and contractions of the apertures between the chambers of the heart, or at the origin of the arteries, hypertrophy and dilatation of the ventricles, aneurisms of the aorta, *innominata*, or subclavian arteries, tumours compressing the origin of the vessels, tubercles and morbid growth of the *pleura*, enlargement or tumours of the liver or spleen, and tumours in the abdomen, either affecting the circulation or compressing the vessels in their course. The second class of causes consist of those in which congestion or inflammation performs an important part of the process of dropsical infiltration and effusion. To this head belong *meningitis* and *arachnitis*, acute and chronic, especially chronic pleurisy, and pleuro-pneumony, *bronchitis*, *pericarditis*, rheumatism of the heart, *peritonitis*, inflammatory congestion of the liver or spleen, inflammatory congestion of the kidneys, tubercular disease of the kidneys, yellow degeneration of the kidneys, and some diseases of the *pancreas*, inflammation of the ovaries or the Graafian vesicles, inflammation of the *tunica vaginalis*, and inflammation of the internal surface of the skin, and the subcutaneous filamentous tissue.

Thirdly, It is to be remarked, with regard to the latter class of dropsical affections, that if the physician see his patient not from the commencement, but long after the dropsical swellings have become generally established, he may overlook altogether their primary source, and in the study of the effects, omit to observe the cause by which they have been produced. It hence results, that in a patient swelled all over, an inexperienced observer may overlook entirely the organ or texture which has been first affected, and thus find great difficulty in tracing the effusion to its original cause.

Dropsy, therefore, is to be viewed as merely a common symptom or effect of many different diseases; and hydrothorax must be considered as a common consequence or symptom of many diseases of the organs contained within the chest, either congestive and inflammatory, or organic and mechanical.

Fourthly, The most common causes of *hydrothorax* in this country are the various affections of the heart, its valves, its apertures, or its chambers, all of which terminate almost invariably in effusion into the cavity of the *pleura*. That bronchial inflammation is also a cause of this disease it is not our intention to deny, because we have more than once seen the symptoms of general *anasarca* and thoracic effusion follow this disease, and disappear when it was removed by the appropriate antiphlogistic measures. But we must add, that we have also witnessed the same dropsical symptoms supervene upon attacks of pleurisy, pleuro-pneumony, and hepatization of the lungs. In the case of dropsy being a symptom of bronchial or pleuritic inflammation, the fact is practically important; since it always holds out more rational hopes of curing the disease than if it depended on dilatation or hypertrophy of the heart, ossification or disorganization of the mitral or semi-lunar valves, arctation of the apertures, ossification or other disease of the *pericardium*, or hepatization of the lungs. It is on this account that the treatment pursued by M. Schroeder van der Kolk was successful; for we know well, that, had the dropsical symptoms depended on any of the affections now enumerated, no remedies, either antiphlogistic or antispasmodic, could have produced any permanent benefit. While, therefore, we must give M. Schroeder van der Kolk full credit for employing rational and judicious measures in the cases he has detailed, we must also add the qualification, that it must not be inferred from the results of these cases, that these measures would produce equal benefit in cases of hydrothorax from disease of the heart, or its valves, or apertures, or induration of the lungs. These measures will apply only in one class, or rather in one small section of cases, and will be quite unavailing in the large and more numerous tribe to which hydrothorax is merely a common symptom.

In offering these strictures on the doctrines taught by the present author, we have no wish. to detract from his merit, or to depreciate his services to pathological science, which we have pleasure in admitting to be very great. But we must say, that he betrays a sad ignorance of the important facts taught during the last fifteen or twenty years by English physicians on this subject; and, with the exception of the treatise of Dr Hastings, their writings appear to be unknown to him. We trust that before this time he has supplied this defect, and made the discovery, that the views entertained by him are not unknown to our countrymen. On this subject, however, we shall not here dwell, as we shall have occasion to recur to it when speaking of another performance.

III. The last subject treated by the author in the present work is that of Gangrene of the Lungs.

This is known to be an extremely rare disease,—so rare, that only one case is found in Morgagni; and its symptoms are so different from those assigned by Laennec, that it may be doubted whether it really were gangrene of the lungs. Among the moderns, Broussais describes it, and gives a remarkable case of the disorder. But Laennec and Lorinser are the two authors who have furnished the most instructive information on its nature and characters.

The present author describes two valuable and well-marked cases, with the necroscopic appearances.

1. A fisherman of 48 years, previously healthy and robust, and without complaint of the chest, was suddenly attacked with severe hæmoptoe, which, in the course of fourteen days, obliged him to enter the hospital. The cheeks were then reddish, the skin round the nostrils yellowish, the tongue little furred, and cough almost constant, though fever was so slight, that he walk-

ed about the hospital making little complaint, except of wandering pain in the middle and right side of the breast. Though the pulse was neither in frequency nor hardness remarkable, blood was drawn from the arm to the extent of six ounces, which next day presented the inflammatory crust. The patient brought up a considerable quantity of bright-red blood, unpreceded by any oppression, but with persistence of the pain already mentioned, and the cough, yet without lesion of respiration. The blood-letting was repeated, the blood still covered with size, and the serum yellowish. As the mouth tasted bitter, and there was a desire to vomit, with slow bowels, the author, suspecting some biliary disorder, prescribed emetic tartar in minute doses with nitre.

Next day the pain in the breast was abated, but the cough was the same, bringing up fetid blackish *sputa* tinged with bloody streaks. No vomiting had taken place, but the bowels had been moved. The tartar-emetic was given up, and refrigerant emollient remedies only were administered. Three days after, sickness and vomiting took place, when antispasmodics were joined to the emollients, and a camphorated cummin plaster was applied over the region of the stomach.

Cough continued without interruption, bringing up fetid viscid, blackish *sputa*, with bloody streaks, and accompanied with most fetid breath, and hiccup and vomiting. An experimental blood-letting was performed to three ounces, which showed no buffy coat. Ten grains of musk were given daily without relief; while the fœtor of the breath increased so much, that the neighbourhood of the patient required fumigations by means of chlorine, night and day. The pulse became small, the features collapsed, and the countenance hippocratic; and, notwithstanding the use of valerian, the mineral acids, extract of rhatany root, and musk, the debility proceeded, with the dark-coloured expectoration, and the patient expired on the 3d of September, four weeks after admission, and six weeks after the reputed commencement of the disease.

Inspection showed the intestines a little red, but not to the degree of inflammation; the liver sound, the gall-bladder filled with bile, and in the abdomen nothing morbid.

The left lung adhered to the costal pleura in different points, and reddish serum was abundantly effused in the interior of the *pleura*. The right lung adhered much more firmly to the *pleura*; and on detaching it in the middle dorsal region by the fingers, the lung was slightly torn, and gave vent to the escape of a blackish most fetid fluid to the extent of a pound, and which most resembled the liquor vomited by persons labouring under cancer of the stomach.

The lung was cautiously removed and injected; and it was then found that a part of it, amounting to at least a fourth, situate chiefly in the middle posterior region, was black, gangrenous, and destroyed. This portion formed, indeed, a large excavation, the inner surface of which was soft, and covered with black flocculent shreds and filaments, in the intervals between which and the remains of the vessels, appeared some capillary blood-vessels filled with wax, which, when the lung was immersed in water, floated freely like the shreds and filaments, much as if by long maceration they had been detached from the surrounding cellular parenchymatous tissue. The part was so fetid, that the odour continued after repeated washing in clean water. The *pleura pulmonalis* at the affected part was thicker than natural, and of a grayish colour, but not tinged with the black tint of the lung. The rest of the lung was sound, and presented no evidence either of inflammation or tubercle, but was perfectly coloured by the injection.

The rest of the body was sound, and by no means fetid.

M. Schroeder van der Kolk justly observes, that it is remarkable that the patient endured this formidable malady so long a period: for, as he was four weeks in the hospital, and as the complaints commenced at least two weeks previous to admission, and as the man had been in the enjoyment of apparent good health, there is every reason to believe that the duration of the disease was about six weeks at least. He infers, therefore, that the disease must have proceeded by slow and successive steps, and that the hemorrhage was the result of the mortification attacking the blood-vessels. The characteristic symptom of the disease was the fetor of the breath; but this does not appear to have been observed till late in the course of the disease; probably till the gangrenous portion was in direct communication with the air inspired and expired. No stethoscopic examination appears to have been at any time made.

2. A robust, man 34 years of age, after fourteen days illness, was brought to the hospital with the following symptoms. The tongue was covered with a dry yellow fur, the mouth had a bitter taste, the face was red, the eyes dull and a little rheumy; he complained of cough and pain in the right side of the breast and difficult expectoration; and he lay on the back and right side, the pulse was soft, and the belly had been moved. Under the use of resolvent remedies the bilious symptoms were abated, but the cough continued without alleviation from the emollient antispasmodics; the strength declined, and occasionally the patient was delirious. Diarrhœa, with great fœtor in the discharges, succeeded, with dry tongue, intense thirst, a foul, lurid and ghastly aspect of the countenance, dusky injection of the sclero-

tic, with dilatation of the pupil, yet without fetor of the breath. Next day, however, the occurrence of this symptom, with fetid mucous blackish *sputa* mixed with blood, difficulty of speech, great anxiety in breathing, with pain in the right side, and small frequent tremulous pulse, put the nature of the case beyond doubt. After some days in this state, with persistence of the diarrhœa and the fetid odour from the mouth, death took place exactly nine days after the first occurrence of the fœtor.

Inspection showed the intestines to be quite sound. The superior half of the spleen was destroyed by a sort of suppuration, with blackness of the adjoining portion of the diaphragm; and above the spleen, inclosed in a pseudo-membranous cyst, was some reddish thick purulent matter.

The left lung adhered by its pleura to the *pleura costalis* and diaphragm, but was in substance sound.

The right lung contained a large cavity filled with black fetid liquor, so extensive that at least half of the lung must have been destroyed. After the arteries were injected with yellow wax, the veins with red, and the lymphatics with mercury, there was seen round the edge of the gangrenous cavity a complete network of lymphatic vessels, which were unusually dilated, and at the gangrenous margin seemed mostly to be closed; for though the mercury had everywhere penetrated to the edge of the mortified portion, in one place only had a little escaped, probably from the rupture of some small vessels. The mercury had further passed by several lymphatic vessels into the bronchial lymphatic glands, which were much enlarged and softened, and showed internally morbid structure—which the author thinks may have arisen from absorption of the morbid gangrenous matter. The cavity was traversed by several large branches of blood-vessels divested of *parenchyma*, a few of which were injected with wax.

From the history of these cases, and from that of a third which took place in the body of a young maniac, M. Schroeder van der Kolk infers, that there is in the commencement of the disease some bilious disorder. Inspection in the case now referred to showed the same morbid change in the right lung, and the same fetid blackish liquor. The countenance in all three cases was unnatural and ghastly, the complexion lurid and leaden-coloured, and the eyes were wild and staring. In the case of the young maniac, however, the cheeks were not red, as in the other two cases. In all of them stupor and anxiety preceded the appearance of the fetid odour of the breath; the pulse became small, feeble, irregular, and tremulous; and the excretion of dark blood-coloured matter proceeded, increasing till the last.

With the idea of the bilious disorder at the commencement we do not altogether agree. It does not appear to us that the symptoms indicate particularly any peculiar disorder of the biliary apparatus, more than they do of other parts of the system of circulation and secretion. The only symptoms from which the author deduces this conclusion, are the yellowish tint of the nose or some parts of the face and surface, the occasionally yellowish fur on the tongue, and the vomiting which took place in the first case only.

It is to be observed, however, that the yellowish tint of the face and surface, does not necessarily indicate derangement in the biliary secretion, or the presence of bile in the blood. That tint is more frequently connected with a deranged state of the circulation generally, and is certainly often associated with states of the system in which the blood is stagnating, flows slowly, or is altogether diseased. Not only, for instance, does it take place in cases of malignant fever, and gangrene from wounds, as in the case of compound fractures, but it takes place after the bite of the rattlesnake, the cobra di capello, and other venomous animals. It is therefore by no means wonderful that it should take place in cases in which gangrene attacks an internal organ.

With regard to the evidence deduced from the appearance of the fur on the tongue, the yellow coating is so common, that we marvel to perceive a person of the observation and judgment of the present author, drawing from it the inference which he does.

It seems to us quite clear, that the gastric symptoms in these cases are merely part of the peculiar febrile disorder, with which the disease is introduced and attended; because we have seen them quite as often in cases of external or traumatic gangrene, as in any other malady.

The author seems to think with Laennec, that this disease depends less upon the intensity of the inflammatory action than upon the peculiar character of the inflammation. In this his judgment appears to be correct, since it seems from an early period of the disorder to assume the gangrenous character. At the same time we must observe, that we want here the evidence afforded by the effects of large and copious blood-lettings, sufficient to check the violence of inflammation, and its progress in an organ so essential to life, so vascular, and so accurately and closely confined within a bony case, as is the lung. May such confinement in a highly inflamed state of the lung not act as a tight ligature?

We have now completed our account of the labours of M. Schroeder van der Kolk, so far as they are yet before the profession. As to the merit of these labours no one can entertain any doubt; and though it may be difficult to assent to all his views, and impossible always to commend his therapeutic measures, yet, they must be regarded as the offspring of an active, inquisitive, and original mind. They will at all events lead the profession to receive with interest any future contributions to morbid anatomy and pathological science which the author may make.

DAVID CRAIGIE.

ART. II.—1. *Annals of Sir Patrick Dun's Hospital, No.* 1. *for the year ending January* 1831, *with Medical Report presented to the Governors.* By JONATHAN OSBORNE, M. D. Physician in Ordinary. Dublin, 1831. 12mo, pp. 71.

2. *On Dropsies connected with Suppressed Perspiration and Coagulable Urine.* By JONATHAN OSBORNE, M. D., President of the King and Queen's College of Physicians in Ireland, Physician to Sir Patrick Dun's Hospital, &c. London, 1835. 12mo, pp. 64.

3. *Cases and Observations illustrative of Renal Disease, accompanied with the Secretion of Albuminous Urine.* By Dr BRIGHT. Guy's Hospital Reports, No. 2. April 1836. Edited by G. H. BARLOW, M. A., &c. and JAMES P. BABINGTON, M. A., &c. London. Pp. 338.—400.

WE have been occupied in communicating to our English readers the results of the researches of a diligent and able foreign physician on the pathology and treatment of dropsy. It is now our duty to make known, not only to our own countrymen, but to our foreign brethren, the labours of an Irish and an English physician on the same subject. The latter part of our duty is, on the present occasion, the more indispensably requisite, because the facts contained in the work of M. Schroeder van der Kolk afford clear evidence, that, notwithstanding our endeavours to make known the doctrines taught on this disease by British physicians, our friends on the Continent are in a state of singular and not very creditable ignorance upon the subject.

The researches of English physicians must be allowed to have indisputably established the three following points. *First*, Dropsical diseases are not always the result either of debility of the absorbents or obstruction to the motion of the blood in the vessels. *Secondly*, They are often the effect of inflammation, which has been either inactively treated, or has been allowed to become chronic,—or of vascular congestion in one or more organs, which has not been removed by the use of adequate and appropriate remedies; and in this class of dropsies the medicines called diuretics are of no avail, until the congestion or inflammation has been removed by the lancet, which, in these circumstances, is the best diuretic. *Thirdly*, Dropsical diseases may also be the result, not only of diseased liver or spleen, but also of disease of the kidney, either congestive, inflammatory, tubercular, cirrhotic, or otherwise affecting the secreting and cortical part.

Among those who have contributed to confirm, to illustrate, and to rectify these principles, the author of the two first tracts holds a highly respectable place. Though the previous researches of Parry and Wells, of Blackhall and Crampton, and of Dr Bright, Dr Christison, and Dr Gregory, necessarily deprived him of the merit of originality, his observations nevertheless are highly useful in furnishing facts, both pathological and therapeutic, which deserve the serious attention of every conscientious practitioner.

Without particularly dwelling on the Report of the cases treated at Sir Patrick Dun's Hospital, the information concerning which may be given at another time and place, we shall confine our present attention to that part which relates to the nature, causes, and treatment of dropsical diseases.

Dropsy, observes Dr Osborne, is an event which depends on a great variety of causes. It is indeed one of the symptomatic effects of several different diseases. In the reports in 1831 he had distinguished the dropsical cases treated at Sir Patrick Dun's hospital into four orders; 1*st*, As they originated in debility; 2*d*, As they depended on impeded circulation; 3*d*, As they were the result of disease of the kidneys; and 4*th*, As they were the direct consequence of inflammatory action in the serous or cellular textures.

I. With regard to the cases referable to the head of debility, after alluding to the usual one of pulmonary consumption, the occasional occurrence of the disease in those enfeebled from an attack of fever, and its presence in the aged generally, he admits that it is rare, and the cases which occurred in the hospital as purely symptomatic, he refers to their just heads.

The great objection, indeed, which in our estimation may be urged against this as a properly admitted cause of dropsical effusion is the fact, that it must always be doubtful whether any given dropsical infiltration really depends on debility, or rather, whether it be not referable to some of the other heads,—such, for instance, as impeded circulation. It is manifest to any one who is acquainted with the physiological constitution of the human body, that not only the very existence of dropsy in the course of consumption, but the whole of the dropsical effusions taking place in the numerous tribe of organic diseases, depend more or less completely, sometimes altogether, on impeded circulation. Thus what is ossification and arctation of the semilunar and mitral valves but impeded circulation? What is aneurism of the aorta or *innominata* but impeded circulation? In what light is hypertrophy either eccentric or concentric to be viewed, unless as an effect and index of impeded circulation, and as itself a cause of impeded circulation. What is an indurated and hepatized lung or an enlarged liver but a cause of impeded circulation; and even chronic *bronchitis*, though partly operating on the pulmonic serous membrane and cellular tissue, may be regarded as in part an important cause of impeded circulation through these organs.

With regard to the dropsical effusions taking place in old age, and which have been so generally both by patients and physicians attributed to the comprehensive and convenient abstraction, debility, these we have personally observed so often to depend upon disease of the heart, induration of the lungs, or some analogous change in one or more of the internal glands, as the liver or kidneys, that we doubt whether it be possible to produce in an aged person a single instance of dropsical infiltration which could be traced to the unaided and unmixed influence of debility, properly so named.

For the reasons now mentioned, it may be justly doubted whether mere debility, as a cause of dropsical infiltration, is not one of very rare occurrence, and whether, if our observation were more accurate, and our knowledge of the preliminary circumstances of dropsical diseases more extensive, they might not either be reduced to an infinitely small proportion compared with the other causes, or whether they might not be eventually excluded altogether from the etiology of the disease.

II. To the second head, that namely of impeded circulation, Dr Osborne refers dropsy supervening on *pneumonia*, and anasarca with *ascites* supervening on *bronchitis* and indurated liver; and in illustration of the influence of these causes on the production of dropsical symptoms, he details the leading circumstances of three cases.

In the first case, which illustrates well the effects of pneumobronchitis in inducing not only general anasarcous infiltration, but meningeal effusion, a woman, aged 60, was admitted on the 3d of March 1830, not only with œdema of the face and lower extremities, cough, with copious semiviscid expectoration, and crepitation at the base of the left lung, and signs of general *bronchitis*, but with stupor and noise in the head, and unusual drowsiness. The pulse was 70, and the disease had been of three months duration.

Detraction of twelve ounces of blood from the temporal artery was followed by disappearance of the stupor and sound in the head; and under the use of a general blood-letting from the arm, with pills of squill, calomel, and foxglove, three times daily, the pneumonic symptoms and the dropsical swellings speedily and almost simultaneously subsided.

In a second case, in which a drunken pensioner of 59, who had distinct hard swelling in the right hypochondriac region, and cough coming on at the same time, *i.e.* about eight months previous to admission; and in whom *œdema* of the feet, *ascites* and hydrocele, with scanty uncoagulable urine, were associated with universal sonorous *rhonchus*, defective respiration at the base of the left lung, *dyspnœa*, produced by lying on the right side, blood was drawn from the arm to the amount of ten ounces, a blister was applied over the *sternum*, and afterwards beneath the clavicles; leeches were applied over the region of the liver, and a blister was placed on the left side, with the use of calomel and squill, and acetate of potass to act on the kidneys; the vapour bath to act on the skin, and gum-ammoniac in pill and mixture to act on the bronchial mucous membrane. Under the use of these means, the hardness and swelling in the site of the liver had become palpably diminished, but with little effect on the urinary secretion, and the symptoms of bronchial inflammation remained also unabated. The symptoms of this malady, indeed, underwent a most serious aggravation on the 18th of August, about four weeks after admission, in the sudden appearance of difficult breathing, palpitation, with very weak pulse, livescence of the lips, and coldness and lividity of the extremities. For these a large blister was applied over the *sternum*, the feet were immersed in hot water, calomel and squill, with lactucarium were ordered, with draughts consisting of Hoffman's anodyne liquor, acetous solution of opium, aromatic hartshorn, and camphor mixture. Under these remedies the urgent symptoms of oppressed breathing were alleviated, and the urinary secretion was increased; but the bronchial disease remained little changed, until a succession of blisters had been applied, after which the cough, difficult breathing, and *rhonchus* diminished, and at the same time the urinary secretion increased, and the swellings receded; and about one month after the patient went out free from complaint.

It is a strong proof of the efficacy of this mode of treatment, that the patient had subsequently, from exposure to cold, and returning to his habits of intemperance, a fresh attack of the bronchial disease with its consequence, the dropsical swellings; and being re-admitted on the 8th November, and subjected to the same method of treatment, he a second time recovered and left the hospital free from complaint.

A third case in which anasarca and ascites had supervened upon chronic bronchial inflammation, and in which the treatment was conducted on the same principles, and with the same success, is so similar that it is unnecessary to enter into its details.

We think it of great importance to direct the attention of practitioners to the principles now stated; because we know from what we have personally witnessed, that they are not only pathologically correct, but they furnish the only rational means of curing a considerable proportion of cases of dropsy, upon which treatment by means of mere diuretics alone, either makes no impression whatever, or one which is prejudicial. Nay, we might further add, that in several cases of this description diuretics are so superfluous, that the moment that the inflammatory symptoms have been subdued by appropriate depletion, the urine begins to increase in quantity, and the dropsical swellings rapidly subside. Several instances quite similar to those now reported by Dr Osborne, we could adduce as presenting the same kind of symptoms, and treated perhaps with a still more exclusive employment of mere antiphlogistic means.

Thus a woman of 56, named Elizabeth Aberdeen, was admitted with general anasarcous swelling, and much *œdema* of the legs and feet, rapid panting respiration, preventing rest in the horizontal posture, cough, pulse at from 96 to 104, scanty urine and dry skin. Stethoscopic examination showed the sonorous *rhonchus* and sibilous wheeze generally diffused over both lungs, inaudibility of vesicular respiration in the lower and central parts of both lungs, with dulness upon percussion, and strong bronchial respiration towards the spine, a preternaturally clear beat of the heart diffused over both sides of the chest, with palpitation, and small, sharp, arterial pulse.

On the night of admission, after some purgative medicine, 18 ounces of blood were drawn from the arm, and the antimonial solution was directed to be given. Next day the respiration was much easier, admitting of the horizontal posture, the palpitation less violent, and the pulse softer and fuller. The respiration was still, however, accompanied with the sonorous *rhonchus* and the sibilous wheeze, though less intense, and less generally diffused. The swelling of the face was decidedly diminished, and that of the feet was less tense, and the amount of the urinary secretion was slightly increased. As the bowels had been opened, the antimonial mixture was continued, and another dose of purgative medicine was ordered at bed-time. Next day, when the bowels had been freely moved, as the symptoms were much the same, about eight ounces more blood were drawn from the arm, and a *linctus* to alleviate the cough, with an opiate at bed-time, was ordered. The following day the urine amounted to five pounds, the swellings were entirely gone, and the cough and difficult breathing were no longer a source of complaint. The use of powders of carbonate of soda, supertartrate of potass, and nitrate of potass, with an occasional cathartic, completed the recovery.

It is also important to observe, that the cases here reported by Dr Osborne bear a close resemblance in symptoms to those reported by Dr Schroeder, and have the advantage, we may be allowed to say without offence to the latter author, in presenting a more energetic and simpler form of treatment, and one which was calculated, we conceive, to remove the dropsical swellings in a shorter time, and with greater rapidity. From both, and from some further facts which shall appear in the course of this article, we would deduce the practical conclusion, that the skilful and rational practitioner will never, in a case of dropsy, prescribe for the mere symptom of scanty urine, but, after inquiring carefully into the state of the different organs, and their respective functions, take such a view of the disease as may lead him to discover on what these symptoms depend, and select and arrange his therapeutic measures in such a manner as may operate on the primary cause of the dropsical swellings, whatever that be.

But it further appears, that not only may inflammatory affections, such as *bronchitis* and *pneumonia* be the cause of dropsical infiltrations, but they may concur with the third cause specified by the author, namely, disease of the kidney, in complicating the disorder, and thereby rendering renal disease more efficient in the production of the effect. It will be seen, for example, that among 36 cases of dropsy from diseased kidney, which came under the notice of Dr Osborne, during the spring and summer of 1833, eighteen laboured under *bronchitis*, in different degrees of intensity; eleven had gastro-enteric inflammation, denoted by thirst, vomiting, or diarrhœa; and in six instances, these two diseases were combined in the same individuals. It thus appears, as remarked by Dr Osborne, that nearly two-thirds of the entire number laboured under inflammation of the mucous membranes; and in such cases it may become a most just subject of inquiry, to what extent these inflammatory affections concurred in producing the dropsical effusion; whether they were not adequate alone to do so, while the renal disease was a secondary circumstance; and whether they were secondary agents, and merely aided the effects of the renal disease.

III. The third cause of dropsical effusion recognised by Dr Osborne is disease of the kidney.

Upon this subject Dr Osborne has made observations which, though not altogether original, are still so important, as to merit the serious attention of the medical practitioner. In giving an idea of his services in this respect, it will be requisite to embody at the same time the illustrations furnished by the recent researches of Dr Bright.

1. In the *first* place, Dr Osborne follows Dr Bright in representing this disease to be distinguished by an albuminous secretion from the kidneys, and this secretion to depend on a morbid change in the structure of the kidney, consisting in the deposition of a grayish granulated substance, resembling portions of fibrine of the blood, first appearing in the cortical or external secreting part, but subsequently extending into the tubular or excreting portion of the gland. He states that, in every case in which he had an opportunity of examining the kidneys of patients secreting albumen, he found this peculiar structure; and he has since ascertained, that this grayish granular mass does not admit the matter of injection. When an injection is thrown into the artery, even in the most successful manner, it will not penetrate the gray deposit, which is chiefly seated in the cortical, but may sometimes fill up the tubular part so much, that the latter is limited to small insulated portions. In these cases the *tubuli* increase in density, and become more confined together, the nearer they approach their termination in the mammillated processes. In some of the most acute cases, he found the lining membrane of the *pelvis* and upper portions of the ureters in a state of the highest vascularity, resembling in appearance crimson velvet. The changes produced in the size of the organ vary. In recent cases, the kidneys are enlarged beyond the natural standard. In long confirmed cases, they are diminished in size, and become proportionally hard;—the cortical structure appearing to be removed, and the gray deposit substituted in its place.

A very good illustrative coloured view of the usual appearance of the kidney in this disease, Dr Osborne gives in an engraving, prefixed to the second publication. It corresponds in all respects with the most exquisite cases delineated by Dr Bright, and with several of those which we have ourselves witnessed.

The urine in this variety of renal disease is always more or less coagulable, so that it contains variable proportions of matter coagulable by heat, and similar reagents, and is at the same time of diminished density. The latter fact and its connections with the presence of albuminous matter, was completely established by the experiments of Dr Christison, and our late colleague Dr James Crawfurd Gregory, with such uniformity that the low density,—that is density varying from 1015 to 1005, or 1007, may be regarded as a proof of the presence of albumen.

The conclusion regarding the coagulability is strongly confirmed by Dr Osborne; and he enters into a pretty decided, if not elaborate defence, of this part of the doctrine against several individuals, who have thought themselves entitled to question its accuracy. He had remarked in his first report, that the urine, though albuminous in this disease, is sometimes, indeed in the majority of instances, not strictly albuminous; and that, though coagulable by heat, it differs in not coagulating with the muriate of mercury (bichloride.) P. 53.

In his subsequent publication, though he admits like others the temporary appearance of albumen in the urine from various causes which derange digestion, he maintains very decidedly the constant connection of coagulable urine with disease of the kidney, and that the secretion never permanently contains albumen, where these glands are not diseased.

The objections which have been urged against the doctrine, that coagulable urine depends upon disease of the kidney, he refers to three heads. The first is, that coagulable urine has occurred in adults who appeared to enjoy good health, and also in children. The second is, that in some persons it can be produced by taking pastry or other indigestible articles of diet. And the third is, that Dr Darwall adduces an instance of a woman who died in consequence of diseased heart, and in whose lungs were scattered tubercles, in whom the kidneys were found in the first stage of the disease described by Dr Bright, yet whose urine did not undergo coagulation.

To the first Dr Osborne very properly replies, that, though albuminous urine is found in persons in the apparent enjoyment of health, yet attentive examination of the functions of such persons, shows that their health is not perfect. It has further been allowed, both by Dr Gregory and the present author, that slight degrees of coagulation, cognizable by the bichloride of mercury, but not by the application of high temperature may exist in persons enjoying apparent good health.

A more decided answer to this objection, however, is found in the whole phenomena of the disease as disclosed by Dr Gregory and Dr Bright, and as witnessed every day in practice. It is a well established fact, that though the urine continues coagulable, persons may either not fall into the dropsical symptoms, or may recover from them, and continue for some years well. We have seen and heard instances of persons who have continued well for years, yet in whose kidneys this change was perceived to have taken place to a very great extent, and in a very marked manner; and Dr Bright mentions, in his present article in the Reports of Guy's Hospital, several very impressive cases of this description. But what is the kind of health enjoyed by these persons? Are they not exactly similar to a person reposing on the brink of a deep gulf? An error in diet, or exposure to cold, or an attack of acute disorder, however slight, is liable in them to induce some inflammation of the brain or its membranes, of the *pleura*, *pericardium*, or *peritoneum*, or some effusion into the brain, which terminates life in a few days, or it may be in a few hours, without the slightest appearance of mitigation from the most judicious and appropriate treatment. These terminations of this disease we have now seen happen so often, that we can consider no person safe, however favourable be the external signs of health in whom the urine is coagulable. On this point most conclusive evidence is furnished by Dr Bright, in the present article, in several of the cases adduced. But perhaps a correct view of the subject may be formed from perusal of the following observations.

" Do we always find such lesion of the kidney, as to bear us out in the belief, that the peculiar condition of the urine to which I have already referred, shows that the disease, call it what we may, is connected necessarily and essentially with the derangement of that organ? After ten years attentive,—though perhaps, I must not say completely impartial observation—I am ready to answer this question in the affirmative; and yet I confess, that I have occasionally met with anomalies which have been somewhat difficult to explain.

" I have certainly seen one or two cases, and have read statements of one or two more, in which the condition of the kidney would have led me to expect albuminous urine, but in which it had not been found to exist. In all these cases, however, the observations on the character of the urine, have been made only a few days or weeks before death, at the close of a protracted illness; or the disease of the kidney has been complicated with other very extensive disease. A case occurred under my care in the clinical ward this winter, where a man died with *ascites* and a complication of most extensive disease of the liver and *peritoneum*, with moderately advanced granulation of the kidney; yet it was only by the most careful examination that any traces of albumen could be detected in his urine: and this leads me to observe, that the secretion is apt to undergo changes, even after the structural disease is established; which renders it requisite that we should not be content with examining the urine on one or two occasions, if we have any reason to suspect the existence of this disease.

" In the first place, it is quite certain, that if, from any cause, the urine becomes alkaline, the application of heat generally fails to produce coagulation; and in the next place, there has appeared to me to be an occasional alternation in the secreting power of the kidney, so that a large quantity of the lithates, or of crystallized lithic sand is deposited, and the albuminous matter is not thrown off.

I have this winter had a case of this kind likewise under my care, in a man whose symptoms bear all the characters of renal disease, complicated with the disease of other viscera. His urine for several weeks was found to be distinctly albuminous: It then became loaded with the lithates, and now throws down abundant crystals of lithic sand, and no longer affords any trace of albumen: and mentioning this case to Dr Addison, I was told, that very lately the converse of this had shown itself in a case to which he had been called. All the symptoms led him to suspect this peculiar form of renal disease; but the urine did not coagulate, and was loaded with lithates. After a short time the lithates disappeared, and now the albumen is very decidedly perceived in the urine.

"That such facts as these tend, in some degree, to render the presence of albumen in the urine, or its absence, a less unerring test, cannot be doubted; but these anomalies are so few as to interfere very little with the general fact. There is no doubt likewise, that the morbid condition of the kidneys, connected with this disease, varies in different cases, to such a degree as to lead to the belief, that the action from which the change has resulted must at least be modified by circumstances and constitutions. The kidney is sometimes simply contracted and hardened; sometimes loaded with an adventitious deposit; sometimes apparently degenerated throughout its whole texture; sometimes affected both with deposit, degeneration, and contraction; all probably the result of chronic excess of action. It is to be expected that modifications should arise in the degree and constancy of the morbid secretion under such varieties of diseased appearance: but this is not as yet satisfactorily known; and I have certainly not always found the quantity of albumen increased in proportion to the apparent advance of the structural disease." P. 341—343.

The latter observation is rather at variance with what is subsequently stated by Dr Osborne.

To the second objection it is justly answered by Dr Osborne, that the temporary, casual or transitory appearance of albumen in the urine is very different, indeed, from the constant, habitual, and permanent presence of that principle in the secreted fluid. A temporary effect may arise from a temporary cause; but when that effect becomes permanent, it must imply that some more important change has taken place. Dr Bright has remarked, that the secretion is liable to variations; and it appears from all the observations made in the Royal Infirmary of this city, that the urine undergoes undulations, or oscillations from a great variety of causes. Within the last six weeks, in the instance of a young lady, in whom the urine became albuminous after a severe attack of scarlet fever, and its albuminous state was accompanied with great dryness of the skin, and œdematous swelling of the face, three several times did the urine fail to give coagulable matter, on the usual temperature being applied, and consequently led to the conclusion that the disease was subsiding. The albumen, however, always reappeared, and was present in some proportion, two weeks ago, when the patient went to the country for the benefit of good air.

To the third objection Dr Osborne very properly replies, that no argument derived from the first stage of the disease can have any weight. That stage it is not easy to distinguish from the natural stage; and if in the confirmed and more advanced stage of the disorder, the urine and the proportion of its ingredients be liable to undulation, and also to sources of fallacy, it is quite manifest that, in a degree infinitely greater, ought we to expect the occurrence of these undulations, and fallacies in the early stage of the disorder.

Upon the whole, we cannot perceive that these objections carry much weight. They are chiefly of a negative nature; and it must be sufficient to establish the fact, that when the urine is permanently and habitually albuminous, the change is connected with some change in the structure of the cortical or secreting portion of the kidneys.

The subsequent observations of Dr Osborne are strongly corroborative of the doctrines taught by Dr Bright on this point.

During five of the eight years for which he has been attached to Sir Patrick Dun's Hospital, thirty-six cases of coagulable urine have came under his observation; and in nine of these which were examined after death, the disease in the cortical part of the kidneys had taken place to a greater or less degree and extent; and the residual cases which did not terminate fatally, proved, as far as proof can be obtained, he contends, by similarity of symptoms, of cause, of collateral circumstances, and the effects of the *juvantia* and *laedentia*, that the kidneys must have been affected in the same manner. Conversely, Dr Osborne has met with numerous cases of dropsy connected with diseased liver, impediments of circulation or respiration, or general debility, which terminated fatally, in which the urine was examined during life, and found not to coagulate, and in which also the kidneys were found to be free from disease. In short, Dr Osborne states, that for the three years previous to January 1834, during which he has sought every opportunity of inspecting the kidneys of every individual whose urine has been examined during life, in no instance did he meet with coagulable urine without diseased kidneys, or healthy kidneys without cogaulable urine. The following may be given as a brief summary of the result of his remarks.

"Though I have anxiously sought for evidence, either adverse or favourable to the opinion, that albuminous urine, when continuously secreted, ought to be considered as a symptom of disease of the kidneys, I have not met with a single instance of urine coagulating in a constant manner, in which an opportunity of examination after death was afforded, that did not present the disease of the kidneys; nor, on the other hand, an instance of the disease being found in the kidney after death, on which in taking a specimen of the urine in the bladder, it did not coagulate. On a review of the notes of all the fatal cases, I am also enabled to state, that the extent of the disease discovered after death, has been, in every instance, in proportion to the degree of coagulation. Thus, when the urine only frothed on the application of heat, the kidneys, though gorged with blood, contained the gray granulated structure exclusively in the outer portions of the cortical substance, and especially at the extremities of the gland; while in cases of complete coagulation, the entire cortical substance was filled, or rather superseded by the deposition now mentioned, and the *tubuli* were both compressed, and rendered indistinct. In some of the cases which have last occurred, I have also to mention, that the emulgent veins were filled with a substance resembling the buffy coat of the blood, but of a curdy texture."—P. 22.

We shall have occasion very shortly to direct the attention of our readers to the lesions found in the various organs of those cut off by this disease, as established by a very extensive table given by Dr Bright. But in the meantime, we must observe, that though it may be unreasonable to expect the accurate correspondence between the degree of albuminous impregnation, and the extent of disease in the kidney here specified by Dr Osborne, the fact of their close proportionate relation is, if always established, extremely important.

2. It is, *secondly*, a most important fact in the history of this malady, that the disease of the kidneys, though the essential and characteristic circumstance, is not the sole or exclusive morbid change. The history of the cases in which it occurs, and the common modes of termination show clearly, that the change in the cortical part of the kidney never proceeds to a great extent, or exists long, without being accompanied with various morbid changes in other organs,—some of short duration and acute character, others more chronic and tedious. It was observed first by Dr Bright, and afterwards by Dr James C. Gregory, that though dropsical effusion is a very common effect of this disease, it is not the only one. The latter observer, for instance, remarked, that of 45 cases in which inspection was obtained, in 35 the lungs, heart, and liver, or intestines were diseased to a greater or less degree; that in 10 of 11 cases in which the head was inspected, more or less serous effusion was found on the surface, or within the ventricles of the brain; and that in 20 of 45, death had taken place without dropsical effusion.* The same physician remarked, that symptoms of an affection of

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* Medical and Surgical Journal, Vol. xxxvi. p. 361.

the lungs, or of the heart presented themselves in a degree more or less marked in 20 out of 35 cases; that vomiting and diarrhœa indicative of gastro-enteric irritation took place sooner or later in 46 of 80 cases; and that pain of the lumbar region, more or less severe and urgent, occurred in 33 of 80 cases.*

These results are very pointedly confirmed by the researches of Dr Bright, given in the paper now under consideration. Thus he gives, in the *first* place, the details of ten cases in which the urine was albuminous during life, and in which this albuminous impregnation was connected with diseased kidney; but which presented, besides, the following symptoms during life and morbid changes after death. The first case, after four years' duration, terminated in apoplectic symptoms, preceded by *hemiplegia*. No inspection. The second case, in which the symptoms of the disease existed eight years at least, and followed an attack of scarlet fever, terminated fatally by convulsions and coma; and after death, besides the mottled granulated state of the kidneys, there was found blood effused between the *dura mater*, and *pia mater*, hypertrophy of the heart, and old adhesions of the *peritonæum*. The third case, after four years' duration, terminated in mortal convulsions. No inspection. The fourth case terminated also, after three years in mortal convulsion; and upon inspection the membranes of the brain were found diseased, the ventricles were distended with fluid, and the heart was hypertrophied. In the fifth case, in which death was also produced by convulsion and *coma*, the appearances in the brain were only those indicative of meningeal apoplexy. In the sixth case, after four or five years of albuminous urine, the disease suddenly terminated fatally by convulsion with apoplexy, and dissection showed similar traces of meningeal apoplexy, with some injection of the convoluted surface of the brain, and hemorrhagic injection of the right lung. In the seventh case, in which anasarcous infiltration was combined with albuminous urine, death took place most suddenly; and the brain was found very vascular. In the eighth, death was accompanied by decided cerebral symptoms; but examination was not obtained. In the ninth and tenth cases, the immediate cause of death was peritoneal inflammation.

These cases show the usual mode in which the fatal event takes place. And it is to be remarked, that though in this disorder death takes place in this sudden manner, with symptoms of effusion within the brain, it does not always happen that the appearances found after death are in any degree proportionate to the intensity of the symptoms during life, according to the usual doctrines of pathology. A very slight effusion, such as is found in cases in which no convulsions have taken place, and no marked apoplectic symptoms have preceded the fatal event, is in many instances the only appreciable lesion. The truth is, that the fatal termination is the result of a species of poisoning by the circulation of urea with the blood through all the organs, and especially in the brain.

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* Medical and Surgical Journal, Vol. xxxvii. p. 79.

This, however, is only one mode in which death takes place in this malady; and though it is undoubtedly the most frequent, it is not the only one. The deleterious influence of the disease is aided by the morbid state in which several different organs are found, and the degree in which these organs are respectively diseased. To show the relative proportion of the different modes of death, and the relative degree in which the different organs are diseased, Dr Bright has digested into the tabular form the principal circumstances, semiographic and pathological, of one hundred cases in which the state of the organs after death was carefully inspected. Thirty-three of these were already published, and he has now added sixty-seven more. From this table the following general conclusions are deduced.

" The principal lesions display themselves in the circulating and respiratory systems, and in the serous membranes. The heart and the lungs, the pleura, the arachnoid and the peritoneum, have, in a large majority of cases, shown marks of disease; while the liver, the spleen, the pancreas, and even the intestines, have frequently been, to all appearance, in a state of health, and have comparatively seldom given proof, by their structure, of any peculiarly diseased action. Of all the membranes, the pleura has decidedly been most often diseased; but that disease has, in forty cases, consisted of old adhesion; which, though it might have been connected with the first attack of renal disease, or might have taken place at some later period, in connection with that affection, may probably only mark the liability of the individual to be affected by atmospheric changes, and may have been the result of some casual inflammatory attack. At all events, the twenty-six cases in which the pleura was apparently healthy, and in three of which its freedom from disease is distinctly stated, prove, that, however general a limited inflammatory action of the pleura may have been, it forms no essential part of the disease. That the pleura is, however, liable to inflammatory action, in a large proportion of these cases, may be inferred from the sixteen instances of recent inflammation; while the serous effusion, which has occurred in forty-one cases, has been connected with that general loss of balance between the actions of the exhalents and the absorbents which is obvious in every part of the system.

" The same tendency to disease which is manifest in the pleura, shews itself, though in a less degree, in other serous membranes. In the pericardium, we have found six instances of old adhesion, eight of recent inflammation, and twenty-three of serous accumulation; and in the peritoneum, ten instances of old adhesion, twelve or thirteen, of well-marked, recent, and often most acute inflammatory action; and twenty-three of the effusion of clear serum, in three of which a false membrane had been formed by chronic action, and again, looking to the arachnoid, we find that membrane rendered opaque, probably by a more or less severe inflammatory action, in thirteen cases; while well-marked serous accumulation had taken place beneath it in twenty-nine cases, and had partially distended the ventricles in six.

"The deviations from health in the heart are well worthy of observation; they have been so frequent, as to show a most important and intimate connection with the disease of which we are treating; while at the same time there have been twenty-seven cases in which no disease could be detected; and six others, which, from not having been noted, lead to the belief that no important deviation from the normal state existed. The obvious structural changes in the heart have consisted chiefly of hypertrophy with or without valvular disease; and what is most striking, out of fifty-two cases of hypertrophy, no valvular disease whatsoever could be detected in thirty-four, but in eleven of these thirty-four, more or less disease existed in the coats of the aorta; still, however, leaving twenty-two without any probable organic cause for the marked hypertrophy generally affecting the left ventricle. This naturally leads us to look for some less local cause for the unusual efforts to which the heart has been impelled; and the two most ready solutions appear to be, either that the altered quality of the blood affords irregular and unwonted stimulus to the organ immediately; or, that it so affects the minute and capillary circulation, as to render greater action necessary to force the blood through the distant subdivisions of the vascular system. The valves chiefly affected have been the semilunar valves of the aorta and the mitral; and in three cases, the tricuspid has been somewhat deranged. In three cases, likewise, the disease of the valves has been unattended by any hypertrophy of the heart.

"It is observable, that the hypertrophy of the heart seems, in some degree, to have kept pace with the advance of disease in the kidneys; for in by far the majority of cases, where the muscular power of the heart was increased, the hardness and contraction of the kidney bespoke the probability of a long continuance of the disease. Six cases are noted, in which the heart was soft and flaccid, and four in which it was unusually small; and in most of these, though not in all, the disease of the kidney had not proceeded to the state of contraction and hardness.

"The principal diseases of the lungs have been œdema and bronchitis, frequently attended by an emphysematous condition of certain portions. Œdema has occurred in thirty-one cases; and it is very commonly the immediate cause of dissolution, or of the increased distress towards the approaching termination of the chronic form of the disease. In six cases, recent, and in five old, traces of pneumonia were found; while the embarrassment to the circulation, caused by these various diseases of the heart and lungs, had occasionally given rise to the effusion of blood into the tissue of the lungs, in the form which is now known by the term of pulmonic apoplexy. The instances in which phthisis, or any form of scrofulous or tuberculous disease, has been connected with the renal affection, have been decidedly rare; so that in only four cases has recent phthisis developed itself: and, what is somewhat remarkable, in more than double that number the disease seems to have made a certain inroad upon the upper lobes of the lungs, and then to have sunk into a state of quiescence, or entirely subsided; from which we should perhaps be inclined to infer, that so far from these diseases being associated, the condition of the body in this form of renal disease is unfavourable to the existence of phthisis, or that it is certainly not peculiarly apt to occur in tuberculous constitutions.

" With regard to the liver and the abdominal viscera generally, as compared with the heart and lungs, a very great immunity from structural disease is to be observed; a fact the more remarkable, as the habits of intemperance with which the renal disease is so frequently connected are those which might be expected to act very directly on the liver and digestive organs. Indeed, to this day, the impression is so strong, as to the injurious effects of stimulants being manifested chiefly on the liver, that the majority of practitioners no sooner see the bloated countenance of anasarca connected with the history of intemperance, than they proceed to consider, in what way the depraved action of the liver is to be corrected, and its morbid changes retarded. Looking to the tables before us, a very different conclusion forces itself upon our mind, as to the condition of the liver in general anasarca, and in that state of cachexia which often attends upon intemperate habits. We here find, in thirty-one cases, the liver distinctly stated to be healthy; and in nine other cases, so free from all suspicion of deranged action, as to be pointed out as remarkable specimens of the healthy organ; thus making forty in the hundred free from disease. In thirty-two cases, any deviation from the natural appearance was exceedingly slight; and was, in a large proportion of them, nothing more than that mottled state which is derived from the irregular distribution of blood throughout the texture—a condition very frequently observed, where the circulation through the chest is obstructed. The instances of confirmed diseased structure did not amount to above eighteen. There seemed to be no marked connection between the condition of the kidney and of the liver; for nearly one-half of those cases which were stated to be remarkably healthy were coupled with the hard and probably most advanced form of the disease, while the other half occurred in cases apparently less advanced; and the more severe cases of hepatic derangement accompanied every variety of the disease in the kidney. The only two instances of fatty degeneration in the liver were in cases where the kidney was soft, smooth, and white; but in another, where the liver was somewhat fatty, the kidney was hard, rough, and lobulated.

" The stomach seems, in many cases, to have suffered from the excessive use of stimulants. In eighteen cases, the effects of irritation on the mucous membrane has been recorded: and as this is an organ which is more likely to pass unnoticed than the liver and some others, it is probable that this number would have been increased, if its condition had been more constantly or accurately examined and noted.

"The spleen and the pancreas have very generally been mentioned as healthy.

"The intestines have, in several cases, though not very generally, shown marked signs of disease. In about nineteen, the small intestines have been irritated in some portions of their courses—in a few of these, ulceration has taken place; and in seven cases the colon or cæcum has been diseased; but several of these have occurred in conjunction with tubercles in the lungs, and have therefore been scarcely ascribable to the peculiar circumstances of this disease.

"The diseases in the substance of the brain itself have chiefly consisted of that unequal distribution of blood which is apt to produce a mottled appearance when the medullary substance is exposed in slices, and which is frequently attendant on convulsive or apoplectic seizures. In some cases, the brain has been exsanguine; and in a few, the results of such lesions as the rupture of vessels may induce, have been observed."—Pp. 395-399.

We have already adverted to the mode in which the fatal termination generally takes place in this disease, and particularly shown its readiness to terminate in an affection of the brain or its membranes, indicated by more or less stupor, sometimes convulsions, and sometimes complete apoplectic seizure. This Dr Osborne regards as a form of *arachnitis*. "In almost all my fatal cases, when not complicated, it terminated life by the production of a low form of *arachnitis*; as was evinced by examination after death. This brought to light opacity of the arachnoid and fluid in the ventricles; the medullary fibres of the brain, however, being unusually firm and distinct.

"The invasion of this form of *arachnitis* was announced in the case of John Smith, (who laboured under *pericarditis*, with copious effusion into the *pericardium*,) by indistinctness of vision, and moaning during sleep, by gradually increasing somnolence, and depression of spirits; and on the day preceding his death he had several seizures of general convulsions, and remained in a state of stupor during the intervals.

"In the case of Anne Doyle there was a large effusion into the right cavity of the thorax. About three weeks before death she began to complain of sounds in her ears resembling the ringing of bells. Although appropriate means were used to relieve the head, yet fits, with foaming at the mouth, insensibility, resembling that of epilepsy, and violent pains at the vertex, continued, with intervals, to her death.

"In the case of John Hacket, aged five years, who also laboured under *enteritis*, and in whom were found several knots of *intersusceptio* in the intestines, death occurred suddenly, but was preceded by convulsive contractions of the right arm; and in addition to opacity and adhesions of the arachnoid and fluid in the ventricles, there was a softening of the surface of the anterior convolutions of the brain.

"In the case of Thomas Caffray, who had been relieved of the *œdema,* and of the most urgent symptoms of chronic *bronchitis* and *emphysema,* an imprudent exposure to cold, and subsequent excess in spirituous liquors, were immediately followed by *diarrhœa* and *delirium;* the function of respiration being nearly unaffected. Within three days from the invasion of those symptoms he was found dead in his bed, having walked about the ward in a delirious state within a few hours of his death.

"In the case of James Brown, who also suffered under *pericarditis,* the fatal event was preceded by a stupor of two days' duration."—Pp. 36–39.

It appears also that occasionally death may take place very suddenly, without very evident marks of affection of the nervous system. But in all, it may be regarded as pretty uniform, that these sudden terminations, which are accompanied with symptoms of almost total *ischuria,* are connected with the retention within the economy of a principle, which ought, for the healthy state of the functions and the continuance of life to be eliminated. The presence of urea in the blood, which was proved by the experiments of Dr Christison,* in a proportion much greater than is compatible with health, seems to be the essential cause of these sudden deaths. The relative proportion of deaths produced by affection of the different organs may be understood from the following statement by Dr Bright.

"The foregoing table likewise affords an instructive average of the immediate causes of death in this disease. I have been able to trace the circumstances connected with the conclusion of life in seventy cases; and find, that no less than thirty out of these seventy have died of well-marked symptoms of cerebral derangements, noted under the titles of 'apoplexy,' 'coma,' convulsion,' and 'epilepsy.' Eight others have died suddenly. In eight cases, the obstructed condition of the lungs has been the immediate cause of death; and in three, the effusion into the chest has hastened the dissolution. Next to head affections, the most prevalent diseases have been inflammatory attacks in the serous membranes; amongst which are five well-marked cases of peritonitis, three of pericarditis, one or two of pleuritis. Diarrhœa and other exhausting diseases have carried off several; and in every case, except two or three, death appears to have been the result, not of casual disease, but of such events as may be said strictly to belong to the condition of the kidney of which we have been treating."—P. 399.

From these observations it clearly results, that, whatever the mode in which the effect is produced, this disease has a singular and peculiar tendency to induce irritation, congestion, and inflammation, in the different serous membranes of the head, chest, and belly; and so far as it is possible to apply pathological reasoning to this subject, the chief cause of the great prevalence of head affections, as the principal cause of the fatal event, is the fact, that the meningeal affection produces a more decided and earlier lesion of the functions of the brain than pleuritic, pericardial, or peritoneal irritation does in the lungs, heart, or intestines, and that the consequent lesion of the cerebral functions more speedily suspends the actions of life. This irritation Dr Osborne appears inclined to ascribe to the presence of the urea in the blood (p. 39;) and it is not impossible that such a substance may operate in this manner. But upon this point, which is of a more speculative nature than the other, we feel it impossible to speak with precision or confidence The fact of irritation and its effects, congestion, and inflammation, is undoubted. But the cause is unknown.

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* Ed. Med. and Surg. Journ. Vol. xxxii. p. 262.

We must observe, however, that we perceive in the whole of these facts, a most beautiful and instructive explanation of the occasional occurrence of dropsical effusion in this disease. That effusion has been very justly ascribed to inflammation attacking the serous membranes and cellular tissue; but it has not been shown why these membranes and the cellular tissue were simultaneously attacked by this disease. It may be inferred from the facts disclosed by the history and morbid anatomy of this disease, that it creates a susceptibility to irritation and inflammation in all the serous membranes, in various degrees of intensity, and that it may either produce acute inflammation with its legitimate products, albuminous exudation forming a layer of coagulable lymph, with purulent fluid, or sero-purulent effusion, or even serous effusion in various degrees of tenuity and abundance.

Before leaving altogether this subject of the mode of death in disease of the kidney, it may be proper to direct the attention of the pathologist to an important deduction which appears almost spontaneously to flow from the facts collected by the various observers of the course and termination of this disease. It has been shown both by Dr Gregory and Dr Bright that the disease of the kidney does not in every case produce dropsical effusion, and that it may go on to the fatal termination without the appearance of this symptom. "The disease may exist in all its force," says Dr Bright, "and may be fatal with its insidious and sudden attacks, without the effusion of a single drop of fluid into the cellular membrane at any period of its course; and still more frequently will fatal instances be found where the anasarca having existed has entirely ceased." P. 371. It is further remarkable, that, though both in the cases in which dropsical effusion occurs, and in which this does not take place, speedy dissolution may ensue by reason of sudden affection of the membranes of the brain, or some equally intense and fatal affection of the *pleura* or lungs, the *pericardium* or heart, and the *peritoneum* or stomach and bowels,—yet the latter result is much more likely to occur in those cases in which there is little or no dropsical infiltration. It must indeed be manifest, that where intense irritation and inflammation attacks the arachnoid, or any one or more of the serous membranes, that inflammation either requires remedies so energetic as to subdue it altogether, or destroys the patient; and in either case dropsical effusion is prevented or anticipated. In cases, however, in which this irritation of the serous membranes is less intense, and proceeds in a more gentle and insidious manner, it gives rise rather to copious infiltration into the cellular tissue and cavities. But further, it must be observed that there is in this disease a species of alternate or vicarious action between the cellular membrane on the one hand, and the cavities of the serous membranes on the other. Where the external cellular tissue is highly anasarcous, there is seldom much affection of the head or chest. In many instances, indeed, it appears, that the occurrence of anasarca diverts the action from the internal organs, especially from the brain, and tends to prolong the life of the patient.

3. In the *third* place; an important question on the etiology of the disease has suggested itself for consideration to Dr Bright, from the facts disclosed by the tabular view of the results of dissection. It has been already seen, that this table demonstrates the existence of disease not in the kidneys only, but in almost every organ of the human body. Dr Bright very properly allows, that we are not at liberty from these facts to infer, that the disease of the kidney has been the primary cause in which the disease of the other organs depended, since some other organ may have suffered first, and the kidneys with the others may have become involved in the general changes. He is nevertheless inclined to believe, that the morbid state of the kidney is the chief promoter of the other derangements.

It would still, however, become a just question, by what cause did the kidney itself become deranged, first probably in action, and then in structure. On this point, Dr Bright is inclined to look upon the skin as a primary agent, and Dr Osborne maintains very decidedly, that suppression of the action of this membrane is the great cause of renal disease and dropsy. Both authors agree in observing, that the most common exciting cause of anasarca is suppression of perspiration from exposure to cold; but Dr Bright somewhat modifies this doctrine, by the additional condition, that it is almost as constantly the fact, that the kidneys have undergone some previous irritation, and that the urine had been previously albuminous. One of the strongest facts in favour of the primary cause being to be found in disorder or suppression of the cutaneous secretion, is the frequency of the occurrence of this disease after scarlet fever, in which the whole surface of that membrane is not only during the course of the disease very hot and dry, but long after its termination it remains dry and in a very unnatural state. Of the influence of this cause in rendering the urine albuminous, even without the positive presence of dropsical symptoms, we have had in this city very conclusive evidence during the last three or four months. Is it to be inferred that any cause which, by repressing the action of the skin, deranging the usual current of its circulation, and throwing an excessive load of blood on the kidneys, may give these glands an excessive degree of duty to perform, is adequate to derange first their function, and eventually their structure? To this conclusion, several facts, and, above all, the views taken and the results obtained by Dr Osborne seem highly favourable.

Suppressed perspiration this physician has been led to place first among the list of exciting causes, because he finds, that, of thirty-six cases of the disease, in twenty-two persons its appearance could be distinctly referred to this cause. The suppression was induced in different modes. In one man, reported of sober habits, but who was liable to profuse sweating of the feet, and who to check this wore fullers' earth in his shoes, perspiration was repressed not only there but all over the body, diarrhœa followed, and when this was subdued, anasarca with coagulable urine succeeded. In another case the commencement of the disease was ascribed to cold bathing. But the most frequent cause was remaining some time in wet clothes. To the same head, doubtless, is to be referred the fact noticed by Dr Osborne that two of his cases ensued on attacks of the influenza which appeared in the spring of 1833. Though the justice of the following explanation may be questioned it deserves to be read. "As the excitement consequent on the suppressed perspiration takes place in the secreting portion of the kidney, and neither in the *tubuli* nor in the membranes no acute pain is perceived; and the patient is usually barely sensible of a weight in the loins or of a thrilling sensation shooting down the thighs. Hence has arisen the obscurity which has attended the formation and establishment of this organic disease." We must acknowledge our inability to perceive why excitement in the cortical portion should not be attended with pain any more than excitement in the tubular portion. Though it be impossible to deny that suppression of the cutaneous secretion is a very fruitful source of dropsical affections with coagulable urine, and is every day seen to produce in those persons whose urine is coagulable, yet, without dropsical symptoms, the most unmanageable forms of disease of the internal organs;—it may be doubted whether alone it is adequate to the formation of the peculiar disorganization of the cortical part of the kidney, now under consideration.

There is in this matter a most serious fallacy, in the circumstance, that it is quite possible, that in the cases adverted to by Dr Osborne, as examples of dropsy induced by suppressed perspiration alone, there might have existed previous disease of the kidneys, which indeed would be rendered so much less capable of performing their duty, that by the diminished and perverted action of the skin, so much more was thus required from them. It is to be remarked that diminished perspiration does not in all persons induce dropsy or the derangement in the urinary secretion now mentioned, and its effects vary according to the constitutional and individual peculiarities, causing in one person rheumatism, in another pleurisy or catarrh, in a third diarrhœa or *peritonitis;* and in a fourth an attack of general fever. When it is followed by dropsy, therefore, there is strong reason to believe, that this particular direction of its influence is the result of the previous disease of the kidney, which is then called into open action. Of this at least we could give several pointed examples.

The cause next in frequency Dr Osborne regards as the abuse of diuretic drinks and medicines, in other words, agents which stimulate, and sometimes to excess, the secreting vessels of the kidneys. The first agent of this class is that of distilled spirits, the habitual use of which is allowed by all the writers on this subject to be the most fertile source of this disease known. It is the opinion of Dr Bright, from what he has seen of the disease in London, where alone he computes that it destroys not less than 500 persons annually, that by no other disease do so many persons become the prey of the vice of the intemperate use of ardent spirits. It has long been observed in Edinburgh both within the Royal Infirmary and among out patients, that though in some instances hereditary predisposition appears to be concerned in the origin of the disorder, yet it occurs most generally in those who have been long in the habit of taking spirituous liquors, either avowedly or secretly. A common class of persons in whom it is found in various degrees in this city is that of the public females, who have, with scarcely a single exception, been accustomed for years to the frequent use of spirits combined, however, with late hours, exposure to cold, and several other causes of deranged health. Another fact to the same effect is that while it was recognized in various degrees in the kidneys of many of those persons who perished by cholera in 1832; in no case was it found where the individual had not been ascertained to have been addicted to the use of these stimulants.

The testimony of Dr Osborne is to the same effect. Of thirty-six cases, ten occurred in confirmed drinkers of ardent spirits; and while this class is limited to less than a third, it is justly presumed that if the truth could be ascertained respecting the mode of life of all the patients, there is no doubt that many more could have been added to the number.

Dr Osborne further thinks that the stimulant diuretics, as squills, cream of tartar, and even the diuretic salts, are not altogether guiltless in contributing to the production of this disease. He remarks that these medicines, though of great utility in many disorders of the chest, and consequently indicated in dropsies depending on or complicated with such affections, yet when long continued, by over-stimulating the kidneys, become the means of stopping the urinary secretion, and inducing the renal disease with its consequences. (P. 34.) He remarks also that in the cases reported by Dr James Gregory in this Journal, the most remarkable diminutions in the urinary secretion took place after the administration of squills and cream of tartar, which have the effect of stimulating the kidneys, and conversely, that in other cases in which the treatment was chiefly confined to blood-letting and purgatives, which have the effect of relieving the kidneys, a greater proportion of successful results was obtained. (P. 41.)

Another circumstance which we have observed to act in many as a cause of this disease, and which is only incidentally alluded to by the present authors, deserves to be mentioned in this place. This is the employment of mercury to affect the constitution, in some instances once only, in others repeatedly. Dr Blackall remarked, that, under the use of this mineral, the urine not unfrequently acquired coagulable properties, in other words, that the secretion became so much deranged that albumen was found in it. Two decided examples, if not more, we have seen in which no doubt could be entertained as to the influence of this mineral, operating probably upon constitutions previously unhealthy, certainly presenting not very equivocal marks of the strumous diathesis, in producing the morbid degeneration in the kidney. Mercury seems in this case to act very much like other excessive stimulants, and by overexciting the glandular part of the kidneys, to lay the foundation of the morbid change.

We have already casually adverted to the great prevalence of this disease in reference to its most usual remote cause, viz. the liberal or rather excessive and habitual use of distilled spirits. On this subject Dr Bright has made some researches which deserve to be known. In the *first* place, in the winter of 1828-1829, he instituted a series of experiments upon 130 patients taken promiscuously as they lay in the wards, and ascertained the state of their urine, as to coagulable or incoagulable properties. In eighteen cases he found the urine decidedly coagulable by heat, and in twelve more he found traces of albumen,—making thirty cases in 130, or one in four, and a third according to the greatest rate, and one in 7¼ according to the smallest rate. According to a subsequent inquiry made in 1832, by Dr Barlow, one of the editors of these Reports, and Mr Tweedie upon 300 individuals, the proportion of cases amounted to one in eleven; and in an inquiry made upon 141 patients at Guy's Hospital in 1835, the proportion amounted to above one in six cases. As, however, in the cases from which the high average was deduced, the experiments were made without making allowance for certain fallacies arising from the chemical constitution of the urine, and the presence of some occasional ingredients, Dr Bright allows that the rate of one in six cases is rather beyond the reality.

4. In the *fourth* place, as to treatment both authors concur in the necessity of looking to the circumstances of the system, with which the first appearance of serous inflammation and anasarcous effusion is attended, namely, the suppression of the secretion from the skin; and both concur in the indispensable necessity of restoring the functions of this membrane. To this point all the remedial measures ought to be directed, and every attempt should be made to relieve the kidneys, and direct the current of the circulation towards the skin. Dr Bright, indeed, contends that this organ may be brought to the power of exercising its functions in a very tolerable degree, without much change being induced in that symptom, which is of all the most important,—the albuminous and altered condition of the urinary secretion. But he admits with Dr Osborne, the great benefit of the diaphoretic mode of treatment, and allows that any want of success which he has experienced, might depend on a less vigorous adoption of this method, in consequence of reposing less confidence in its effects.

The diaphoretics employed by Dr Bright are the antimonial powders, the compound ipecacuan powder, and the spirit of Mindererus, with confinement to bed, the occasional use of the warm bath, and fomentations, and large linseed poultices to the loins and belly. Tartarized antimony also has been found useful both by him and by Dr Barlow; and besides these he recommends flannel clothing and residence in a warm climate.

Blood-letting, general and local, on the commencement of the disease, he regards as highly beneficial; but doubts their good effects at later periods, unless where there are manifest symptoms of inflammation of the serous membranes. Local bleeding from the head by cupping, when that region is affected, and from the loins by cupping or leeching, he also commends. We may add, that in more than one instance in which we have seen the disease resist the influence of cream of tartar, squill, and other diuretics, a general bleeding from the arm has been followed by subsidence of all the swellings, and a manifest improvement in the condition of the urine.

Among purgatives, which he regards as effectual in reducing the anasarca, he employs the saline, rhubarb with sulphate of potass, and elaterium followed by castor-oil.

To diuretics Dr Bright is opposed, but allows that foxglove is sometimes requisite, and he admits, that, though occasionally obliged to use them, he does so as necessary evils.

Among other remedies which operate more slowly and gradually through the medium of the stomach, he uses carbonate of soda in small doses, *arbutus uva ursi*, antimonials, wine of iron, and the muriated tincture.

In regulating diet he properly allows nutritive but not stimulating articles and ingredients. From the use of wine and spirits he dissuades.

The method employed by Dr Osborne is so decidedly diaphoretic, that it requires to be mentioned separately, in order to be justly understood. The first measure is to keep the patient in bed, in order to promote the cutaneous discharge; and the first medicine exhibited is usually a purgative, in the choice of which the author avoids those articles, as compound jalap powder or cream of tartar, which have any tendency to prove diuretic, and generally employs senna mixture. He then commences a diaphoretic course, by administering foot-baths, hip-baths, or general baths of hot water or vapour, according to their effects upon the patient, who also takes at night eight grains of James's powder, with four of Dover's, and ten grains of aromatic confection, unless in case of stupor, when Dover's powder is withheld. In one case, in which no perspiration followed the use of these means, it ensued after the use of a mixture consisting of four ounces of spirit of Mindererus, one ounce of sublimed sulphur, one drachm of ipecacuan wine, two grains of watery extract of opium, two ounces of fennel water, two of syrup, and two of treacle, given in the dose of one ounce every hour. The latter ingredient is known to act occasionally on the skin.

When the vapour bath is not attended by sweating from want of reaction in the system of the patient, he is directed while in it to take two drachms of the ammoniated tincture of guiacum. When both vapour and water baths are followed by coldness of the extremities they are discontinued. The bed is warmed for the reception of the patient on his return.

"When there was a continued tendency to coldness of the surface, unaccompanied by feeble action of the heart, the diaphoretic preferred was *Tinct. Guaiaci Ammoniat.* ʒij. *Sulphuris Loti* ʒj.

Mist. Camph. ℥j. *Sp. Piment.* ʒss., or the following: ℞. *Carbon. Ammon.* ʒss. *Mist. Camph.* ℥vj., an ounce to be taken every two hours. In connection with these remedies, administered in the evening with a view to procure a perspiration during the hours of sleep, warm applications were kept up during the day, and frequently a succession of bags of hot salt was maintained, when the heat of the extremities could not be otherwise preserved. When perspiration was restored in one part of the body, as in the trunk, but not in the limbs, the latter were rubbed several times during the day with an infusion of two drachms of bruised mustard seeds in distilled vinegar, with naphtha, or some other suitable stimulating embrocation.

"Having never failed in removing this kind of general dropsy *whenever the entire surface of the body was restored to a perspiring state*, it is not surprising that I should bestow the utmost attention on this part of the treatment. In a great number of cases, and especially those connected with bronchitis, the patient took three times daily, an ounce of the following mixture: ℞. *Balsami Copaibae* ʒi. *Muc. Gum. Arab.* ℥iijss. *Sacch.* q. s. ft. *Emulsio, Adde Aquæ Cinnamomi Mist. Camph. utriusque* ℥ij.—The use of this was first suggested by the appearance of the mucus in the urine, which in almost every case denoted irritation in the urinary passages; and in chronic bronchitis, with scanty and opake secretion, there is no more valuable remedy. Copaiba has been set down in the Manual of Materia Medica as a diuretic; but I never recognized this effect from it, except through its agency in diminishing irritation in the urinary passages. When given to patients who were kept under the influence of external heat, it always acted as a diaphoretic, and was peculiarly valuable in answering the indications usually co-existing in those cases."—Pp. 44–46.

Next to the restoration of the function of the skin, and indeed in most cases expedient, as contributing, Dr Osborne says, to that object was blood-letting. The circumstances on which the indications for this measure were founded, were 1*st*, the full and undulating pulse, which resembled that commonly occurring in nephritis; 2*d*, the co-existence of inflammation in other parts; 3*d*, pain or weight in the region of the kidneys; and 4*th*, the appearance of blood in the urine. The blood drawn was not usually buffed; but the serum in almost every case was turbid. This appearance is indeed common in this disease, and depends on the presence of oil in the serum. Local blood-letting by cupping or leeches from the loins was also used under the same circumstances.

Blisters, the use of which as a means of revulsion, he allows under certain circumstances, he recommends to be induced by applying lint steeped in tincture of cantharides, and covered with oiled silk—as a mode more cleanly, more rapid in action, and not liable to tear the cuticle. The blistered surface he recommends to be dressed with iodine ointment.

In the use of purgatives, which he appears to have employed little, he was influenced by the apprehension of inducing diarrhoea, and the desire to determine towards the skin; and those preferably employed were senna mixture, castor-oil, and rhubarb and magnesia.

Calomel, though found useful in obviating effusion in affection of the head, he regards as beneficial neither to the action of the skin, nor that of the kidney; and he remarks, as Dr Bright already has done, that it seemed to cause salivation with unusual rapidity.

It is no small proof of the beneficial effects of the method now described that among thirty-six cases treated according to its principles, twenty-seven recovered with disappearance of *œdema*, only nine having died. It is true that the albumen did not entirely disappear; but the patients felt themselves sufficiently recovered to require no further treatment.

In two cases under the use of iodine given at the rate of one grain and a half, with three grains of hydriodate of potass in a pint of water, in the course of the day, the œdema disappeared, and the urine completely recovered its colour and transparency, and became so much less coagulable, that had these patients remained in hospital longer, Dr Osborne thinks that the albumen would have entirely disappeared.

Complications with local inflammation, as *bronchitis*, *pericarditis*, and *peritonitis*, or with symptoms of diseased heart, he opposes by the judicious application of appropriate remedies.

In conclusion, Dr Osborne gives the following summary of his pathological views and therapeutic measures in this disease, which must be regarded as rational and judicious.

" *1st,* That it is always connected with disease of the kidney, which, when sufficiently advanced, is marked by the deposition of a grayish structure, impermeable to injections, within the substance of that organ.

" *2d,* That the suppression of perspiration is the most general cause of this disease; and the long-continued excitement of the organ by spirituous liquors, or diuretics, the next in order of frequency and importance.

" *3d,* That the most successful treatment consists in the restoration of the functions of the skin; which being accomplished, the disease, if free from complications, never fails to be removed.

" *4th,* That bleeding and purgatives are also suitable remedies; while diuretics are either injurious, or, if removing the swellings for a time, tend ultimately to cause a return of the disease, under a more aggravated and intractable form."—P. 61.

In these views we entirely concur, and recommend their consideration to our readers of every rank and order.

We must say, nevertheless, that we are not prepared to admit unconditionally his inference, that this disease is to be viewed as a species of *Anidrosis*, or want of cutaneous action. This we regard as a mistake, not much less than that of referring it to the head of dropsies. The dropsical effusion is a mere symptom, and not a constant one. The dry unperspiring skin, in like manner, though more uniform, may be nothing more than a symptom.

IV. We have now, after a digression rather long, to proceed to the consideration of the fourth cause of dropsy assigned by Dr Osborne, viz. inflammation. Of the reality of this as a cause of effusion into the cavities of the serous membranes no doubt can be entertained; for every one of these membranes is more or less liable to become distended from the operation of this cause. Upon its exclusive operation, however, some doubt has been thrown by the discovery of the facts already considered under the last head. Excepting, therefore, the case of *hydrocephalus*, it must always become a question, in any given case of dropsy, whether it depends on inflammation connected with disease of the kidney, or on inflammation, which is primary and independent of that malady. Dr Osborne himself admits in the report before us, that "it is generally accompanied by the peculiar disease of the kidney above described, and has consequently been thought to be always accompanied by coagulable urine." (P. 64.)

At one statement made under this head, we are somewhat surprised. Dr Osborne says, that "in *anasarca* after *scarlatina* no coagulation takes place." This we conceive must have been made without due consideration. Independent of the experience of the present year, in which we have found the urine coagulable after scarlatina, both with and without dropsical effusion, if Dr Osborne will refer to a paper by Mr Hamilton in the thirty-ninth volume (p. 140) of this Journal, he will find conclusive evidence to show, that the urine may be coagulable after scarlet fever, and that the structure of the kidney may be exquisitely changed. Mr Hamilton showed us, at the period referred to, the kidney of a child cut off after scarlet fever, in which the buff-coloured granular deposit had taken place to a great extent, and in a very distinct form.

These several facts would tend to abolish entirely the head of inflammation, as an exclusive and separate cause of dropsical effusion, since it would naturally arrange itself under the head of disease of the kidney. The propriety of this innovation may nevertheless be questioned; and though we feel it requisite to point out the objections to which it is liable, and to notice the fallacies on which its admission depends, we perceive no great harm in allowing it to hold its place, in so far as it is the immediate circumstance on which the dropsical effusion depends. The distinction involves almost no practical difference, since the treatment is nearly the same.

Art. III. 1.—*A Practical Compendium of Midwifery; being the Course of Lectures on Midwifery and the Diseases of Women and Infants delivered at St Bartholomew's Hospital,* by the late Robert Gooch, M. D., prepared for publication by George Skinner, M. A. C. S., &c. London, 1831. 12mo. Pp. 358.

2. *The Dublin Practice of Midwifery.* By Henry Maunsell, M. D., &c. London, 1834. 12mo. Pp. 244.

3. *Manual of Practical Midwifery; containing a Description of Natural and Difficult Labours, with their management, and illustrated by fifteen engravings.* By James Reid, M. D., &c. London, 1836, 12mo. Pp. 246.

The feeling of the necessity of compendious and condensed manuals on the practical branches of the healing art is pretty general; and the only rational objection that can be urged against them is, that they are liable to give a taste for acquiring the knowledge of mere results and practical measures, without any attention to the principles from which these are deduced. Every practitioner, however, feels that there occur emergencies in which it is highly desirable, if not absolutely necessary, to remember shortly what should be done, and to refresh the memory with such portions of information as may prove most useful in the difficulties which are most liable to take place.

In the Practice of Midwifery this feeling seems to be strongly experienced both by the student and the junior practitioner. Dr Maunsell remarks, that teachers must have felt "the difficulty of satisfactorily answering a question commonly put to them by students, viz. What book do you recommend me to take to the lying-in-room?" This question we should have felt no difficulty in answering; for we should have at once said, "Take no book at all; but impress on your mind the most frequent and important obstetric emergencies and difficulties with the practical rules respectively adapted to each; preserve your presence of mind; do nothing rashly; and leave the rest to Providence and the powers of Nature." Such would be our advice and procedure generally. It appears, however, that such a course, if not quite impracticable in the obstetric art, is at least so difficult that the necessity of some compendious and portable adviser is a sort of necessary evil. Dr Reid states, that "he has frequently heard students and those just entering on the arduous practical duties of the accoucheur complain of the want of a work, which, while it should include all the information that might be necessary in the moment of doubt and difficulty could still, from its size, be portable and easily referred to at the precise time, when assistance is so anxiously required, and delay might be so perilous." It thus appears from the testimony of these authors to be regarded as either impracticable to render the information mentally portable, or unsafe to trust the whole to the memory. The student and junior practitioner require a compendious guide, which may be consulted as occasion suggests, and which may furnish at once, without the labour of perusing many pages, the requisite information.

It must farther be admitted that even the plan which we suggest, implies the previous one of methodical arrangement and condensation from the elaborate and systematic treatises; and if this can be accomplished neatly and successfully, a work so composed, it is impossible to deny, must be extremely useful.

The first work in our list, though not exactly intended for the purpose now specified, is nevertheless so well calculated, by its brevity and precision, the attractive manner in which it is written, and the decided common sense tone of its principles and precepts, to answer this end, that we think it is likely to become a valuable and favourite guide to the young obstetric practitioner. It may be regarded as a sort of midwifery made as easy as it can be. It is more extensive than either of the other two works, and gives fuller views of each subject. But every thing is treated with such clearness and precision, and the subjects are illustrated in a manner so animated, that it must be difficult for the student to forget the lessons once delivered. The cases introduced in various parts are also highly interesting, and tend powerfully to impress the doctrines and precepts of the author.

The whole work consists of seven lectures, each of which is divided into two or more sections.

The first lecture, on the natural functions, and on the diseases of the female organs of generation, consists of two sections,—the first on menstruation, and the second on the diseased states of that function.

In the second lecture, which is devoted to the subject of pregnancy, that subject is considered in seven sections, under the following heads; 1*st* The theory of conception; 2*d*, The gravid *uterus*; 3*d*, The position of the child *in utero*; 4*th*, The signs of pregnancy; 5*th*, The diseases of pregnancy; 6*th*, *Retroversio uteri*; and 7*th*, Abortion.

In the third lecture, labour is treated in two sections, the first on natural labour, and the second on the management of the placenta.

The fourth lecture, which is devoted to the subject of difficult labour, consists of three sections, the first on impeded labour, the second on preternatural presentations, and the third on complicated labour, each subdivided into several subsections.

The first section embraces the following seven subjects; on the injuries arising from protracted labour; on the employment of the forceps; on the employment of the vectis; on craniotomy; on artificial premature labour; on section of the *symphysis pubis*; and lastly, on the Cæsarean section.

In the second section, on preternatural presentations, are considered presentation of the feet, of the breech, of the arm, and of the chord.

In the section on complicated labour are considered puerperal convulsions, hemorrhage before the birth of the child, plurality of children, and rupture of the womb.

In the fifth lecture, which is on the general management of women after delivery, and on the treatment of the common affections of the puerperal state, the subject is considered in the following order, in successive sections; the general management of women after delivery; after-pains; diet; unfavourable nipples; excoriation of the nipples; and mammary or milk abscess.

In the sixth lecture, on the diseases of women after delivery, are considered puerperal or child-bed fever, inflammation of the womb, puerperal mania, *phlegmasia dolens*, and inversion of the womb.

The seventh lecture, on the general management, on the malformations, and on the diseases of infants, is divided into three sections, corresponding to their respective subjects.

In the second section, on the malformations, the following subjects are rapidly reviewed; hare-lip, defects of the *umbilicus*, closed *labia pudendi*, *imperforate urethra* in the male, imperforate anus, *spina bifida*, contorted feet, &c.

In the third section, on the diseases of infants, are considered the causes, nature, and treatment of diarrhœa, watery gripes, chronic diarrhœa, convulsions, disorders depending on dentition, infantile remittent fever, croup, and spasmodic croup.

On all these subjects the author displays the sound sense, acuteness, discrimination, and decision for which he was in life so distinguished; and while he evinces perfect and intimate acquaintance with each subject, he troubles his hearer or reader with no more than is absolutely necessary for him to know. The instructions also contain a great many minute but useful hints and cautions, such as must have occurred to a person of great natural address and observation, but which no books of any kind have ever taught; and though many of the advices are delivered with a tone of levity and smartness, sometimes coarse and a little alien from the manner of a grave teacher, probably the subject is not altogether unnaturally treated in this manner.

In proof of his acuteness and discrimination in recognizing the presence or absence of pregnancy, and as a general average specimen of his manner and style, the following extracts may be taken.

"There are three classes of persons by whom you are likely to be consulted, namely, young unmarried women, who will solemnly assert that they are not pregnant, yet have big bellies, &c.; women with ovarian dropsy; and married women, who think they are pregnant, when they are not. I will give you a little advice relative to the unmarried class. Never give an opinion till six months have elapsed since the last menstruation. Do not believe one word they say. Listen to them as you would to a jockey praising his horse. A medical man requested me to accompany him a few miles in the country to see a young lady in fashionable life, who had a peculiar tumefaction of the abdomen, and milk in her breasts, to which he did not attach any importance. When we arrived, he said he had brought an accoucheur, a friend of his. I was permitted to examine her as I pleased. I laid my hand, which is naturally cold, on the abdomen, and felt the child move; the navel was raised, and the belly hard. This was enough to satisfy me; but as it was expected that I should do every thing that was customary, I introduced my finger into the vagina, found the *cervix uteri* obliterated, and a hard tumour resting on the *symphysis pubis*, and on pushing it upwards, I felt the child drop again on my finger. I went down stairs, and told the medical man she was with child. He was astonished. In six weeks after I delivered her of a child. I have met with many similar cases. Never rely upon the evidence of their tongues, but on that of their bellies."—P. 103.

The counterpart of this is the following.

"A young man and woman fell in love with each other, and although their parents objected, they contrived to get married unknown to them; they returned respectively to their homes, and lived with their parents to keep all quiet, but used to meet now and then. At length the female became sick in the morning, her abdomen tumid, so much so that her sisters remarked what a large belly she had; the young married female, taking it for granted that she was pregnant, as she had full breasts, morning sickness, and a cessation of her menses, confessed her marriage, and a house was taken in which she lived with her husband. At about seven months from the commencement of her symptoms I was consulted; when, on feeling her abdomen and finding it soft, I expressed a doubt as to the nature of her case. I then examined *per vaginam*, and discovered the *cervix uteri* as long as in the unimpregnated state, and upon this evidence asserted that she was not pregnant. I put her under a plan of treatment, consisting of purgative medicine every morning, so as to procure four or five evacuations daily, together with tonics. After this plan had been followed ten days, the purgatives were given only every second day: under this treatment she became perfectly well."—Pp. 104–105.

Of promptitude and decision in alarming circumstances during uterine hemorrhage after delivery, the following account may be taken as a good instance.

"There are many cases in which flooding begins immediately after the birth of the child. I was requested by a lady, who was accustomed to have profuse flooding immediately after the birth of the child, to attend her at her next confinement. The membranes were ruptured before I arrived; her face was much flushed; her pulse full and rapid. What was the cause of this disturbed state of the circulation? Did it proceed from the apprehension of danger, or was it from her having taken three glasses of wine daily after dinner, and a pint of porter at supper, fearing she should want strength during her labour? Be this as it may, she fell into labour with a disturbed state of the circulation; and the child was born soon after my arrival. I secured the navel string, and gave the child to the nurse; but, being prepared for hemorrhage, I determined not to interfere with the placenta until it was separated. With one hand I used friction on the abdomen; and with the other under the clothes felt if there was any hemorrhage. In five minutes, she said there was a quantity of something coming away, and gush came the blood from the vagina. I passed up my finger, and found the placenta separated and forced a little way into the vagina; and by a gentle extension of the cord I extracted it, when the hemorrhage immediately ceased. I now thought all flooding was over, but it soon began again; her pulse sunk, and she fainted. A short time before this case occurred, Mr Rigby, in a conversation with me on this subject, had expressed a favourable opinion of plugging the vagina with cloths dipped in vinegar, as recommended by Le Roux, remarking, that the lives of many had been saved by it; but I feared, as the uterus is large at this time, that blood would still flow into it, the escape of which being prevented by the plugging of the vagina, the case would merely be converted into one of internal hemorrhage. However, I determined to give this mode of treatment a trial in the present instance; and therefore called for large pieces of linen, which, being first dipped in vinegar, I pushed one by one up the vagina, almost into the uterus. The hemorrhage seemed to cease; the patient recovered from her syncope; and I again thought all danger was over. She had afterwards a few trifling pains: the belly began to swell, and again she fainted; but gradually so far recovered as to express a wish to see her husband and children before she died; and I expected she would have died: her mouth was drawn on one side, and she became convulsed. I would have given any thing for a consultation, but in these cases there is no time for it; the life of the patient depends on the man who is on the spot: he must stand to his gun, and trust to his own resources. A practitioner who is not fully competent to undertake the management of these cases of hemorrhage, can never conscientiously cross the threshold of a lying-in room. I immediately pulled away the plugs from the vagina, and introduced my hand into the uterus, through a quantity of half-coagulated blood, up to the fundus, where, inclining towards the front of the uterus, I felt something ragged projecting from the surface: to this part I applied my fist, and made counter-pressure with my hand externally. The hemorrhage ceased, and no more blood came away. In two or three minutes the uterus began to contract, and I found my hand pushed gradually lower and lower, until expelled by the complete contraction of the uterus. I then withdrew my hand from the vagina, and the hemorrhage did not recur. A few minutes elapsed when she opened her eyes, and asked if all danger was over. I replied she was much better. and directed her to remain quiet. The effect of the stimulus of my hand, or of its pressure against the parietes of the uterus, was instantaneous; and in three days she was so much recovered that she appeared to suffer nothing from the loss of blood. The best method then at once of making pressure on the bleeding vessels, and of exciting the contraction of the uterus, is, to introduce the hand into the uterus, and applying the fist firmly to that portion of its surface over which the placenta was attached, make on the outside a counter-resistance with the other hand: this is much more effectual than friction on the abdomen, or tickling the uterus internally with your finger."—Pp. 163–167.

In the medical management of women, both in the pregnant and puerperal state, his directions are safe and judicious, and his practice prompt and energetic. To the stimulating and feeding system he is decidedly opposed; and treats puerperal convulsions, as they ought always to be treated, by the liberal use of the lancet and active purgatives.

On the subject of puerperal mania, we perceive a considerable part of his paper, which was published in the Transactions of the Royal College of Physicians. The observations are judicious and instructive as well as amusing, and, like all the writings of Dr Gooch, will be perused with great interest and advantage.

Though it may be regarded as unfortunate that the present work is a posthumous bequest of the intelligent and lamented author, we think, from the manner in which it is published, that so far as circumstances so unfavourable permit, it is edited in a creditable manner by Mr Skinner, who has also added a few notes. In short, the present treatise, though small and compendious, contains all the essential materials of a good and useful text-book on the principles and practice of midwifery.

The latter two works in our list approach more closely to the character of mere pocket manuals.

The publication of Dr Maunsell is neatly and agreeably compiled, and gives a very good compendious view of these systematic and practical points in midwifery requisite to practise the art with comfort and success. The method of arrangement is extremely simple. The whole book consists of twenty-three chapters, in which the following subjects are treated in successive order; the *pelvis*, the foetus, the mechanism of parturition, the anatomy of the organs of generation, the physiology of the organs of generation, the gravid womb, the signs of pregnancy, natural labour, the duties of accoucheur, the varieties of natural labour, difficult labour, obstetric operations and the use of instruments, preternatural labour, hemorrhage, convulsions, plurality of children, preservation of the blind, rupture of the womb, the management of puerperal females, puerperal fever, the ordinary fever of puerperal females, *phlegmasia dolens*, and puerperal mania.

In treating these several subjects, Dr Maunsell has evidently taken great pains to communicate the most recent and accurate information in the most condensed form. His opportunities, as superintending accoucheur to the Wellesley Female Institution, have enabled him to collect personally much useful information on many important points in obstetrical medicine and surgery, and to give directions, the result of sound judgment, matured by observation and reflection. But he has also availed himself of the extensive and accurate researches of Professor Naegele of Heidelberg, and other creditable authorities. Thus in explaining the mechanism of parturition, and describing the different positions of the head in the process of expulsion from the *uterus*, he properly directs the attention of the student to the position most common, as ascertained by the multiplied observations of that teacher. "As the force of the *uterus* continues to act upon the head, the round and bulky vertex and tuberosity of one parietal bone are directed against the inclined plane formed by one of the spines of the *ischia*, and by it guided forwards towards the neighbouring *acetabulum*, while the less bulky but smooth forehead is, by the same motion, passed backwards towards the sacro-iliac *synchondrosis* of its own side. In this situation the head is expelled, the case being in fact converted into one of the first position. This I believe is the usual course. Professor Naegele of Heidelberg observed it to occur in ninety-three out of ninety-six cases."—P. 24.

Though the book is professedly without any show of learning or display of authorities, it gives a very just view of the present state of obstetrical science and practice; and it may be safely recommended to the student and junior practitioner as a judicious and useful guide.

In a new edition, we would suggest to the author, that he give the numerical averages not from the Wellesley Institution only, but from the large hospitals of France, and from the Dublin Lying-in Hospital, as recently furnished in the valuable work of the late master, Dr Robert Collins. Such an addition would add much to the value of the work, as a source of precise information on obstetrical points.

The third work in our list, though presenting a mode of arrangement less clear and methodical than either of the two preceding, is nevertheless by no means void of good qualities.

The author first treats as usual of the dimensions of the pelvis and the fœtal head, then of the female organs of generation, and gestation, and next proceeds to the subject of labour.

This process he distinguishes, after the example of Dr Denman, into four kinds or classes, as he terms them; *1st*, Natural labour; *2d*, Difficult or laborious labour; *3d*, Preternatural labour; and *4th*, Complex labour. Under the first of these heads, are given several valuable numerical averages of the respective frequency of the position of the head in natural labour, and the relative frequency of presentation of its different regions.

Under the head of instrumental labour, the author gives the average number of cases requiring the use of the forceps according to Merriman, Mad. Boivin, Velpeau, and himself, being 1 in 93 in the experience of the first, 1 in 215 in the experience of the second, 1 in 200 in that of the third, and 1 in 207 in his own experience.

Under the head of preternatural presentations, the average frequency of the breech presentation is given, according to Mad. Lachapelle, Mad. Boivin, and Dr Merriman, being 1 in 45½ in the experience of the first practitioner, 1 in 55 in that of the second, and 1 in 86 in that of the third. In the Dublin Lying-in Hospital, during the mastership of Dr Collins, it appears to have been 242 in 16,414 or 1 in 67⅝. In like manner, the average of presentations of the feet is given as 1 in 70, according to Lachapelle, and 1 in 78 according to Merriman. Dr Maunsell states the average of presentations of the lower extremities, including, we presume, breech and footling cases, at the Wellesley Institution, to be during 1832 and 1833, 1 in 42 cases. In the Dublin Lying-in Hospital, they appear to have been 1 in 129 cases. The average of presentations of the superior extremity is stated to be as 1 in 263, according to Naegele, 1 in 200 according to Madame Lachapelle, and 1 in 170 according to Dr Merriman. In the Dublin Lying-in Hospital, the amount was 40 in 16,414 cases, giving an average of 1 in 410 cases. Dr Maunsell states the average of presentations of the upper extremities at the Wellesley Institution, during 1833 and 1834, to be 1 in 210 cases. It appears further, that in the experience of Madame Boivin, turning was required, once in every 93 cases of arm presentation. In the practice of Dr Collins at the Dublin Lying-in Hospital, turning was performed in 33 cases of the 40.

Under the same head, the average of cases in which a prolapsus of the chord takes place, is represented to be as 1 in 473 according to the experience of Baudelocque, as 1 in 381 cases according to the experience of Mad. Lachapelle, and as 1 in 368 according to the experience of Dr Merriman. By Dr Maunsell at the Wellesley Institution, during 1832 and 1833, the average of presentations of the chord is stated to be 2 in 839, or 1 in 419½ cases.

Similar numerical averages are given under the heads of flooding and puerperal convulsions, tending to show the comparative frequency of these complications in parturition.

We have thus given a short account of each of these works, to enable those who have the charge of obstetrical students to advise their pupils as to the best guide. Each work has its peculiar advantages, though perhaps none is altogether better than the other. Among the two latter works, that of Dr Maunsell is the most convenient in point of methodical arrangement and practical utility. That of Dr Reid has a great advantage in its numerical averages. As to practical purposes, we think it is of little moment which is chosen. Either of them will answer the purpose intended. One word, however, applicable to both, we have still to add,—that we think neither will do, if the student is allowed to trust to them only. He must use them chiefly to impress on his memory the facts which it is most important for him to bear in mind; and he should be early taught that it will not do to read in the lying-in chamber, or to carry in his pocket the information which he ought to have in his head.

Art. IV.—*The Cyclopædia of Anatomy and Physiology.* Edited by Robert B. Todd, M. B., Lecturer on Anatomy and Physiology at the Westminster School of Medicine, &c. &c. Part I. June 1835; Part II. August 1835; Part III. October 1835; Part IV. December 1835; Part V. March 1836; Part VI. May 1836.

The taste for works constructed upon the principle of alphabetical arrangement is becoming daily more general, and is pervading almost every department of science and art. Though the French were in this, as in most other things, our predecessors, and have carried the system to a very great extent, and brought it to a high degree of perfection, we follow at no very remote distance; and in many respects we may without exaggeration say, that we have improved upon our masters.

This method of communicating knowledge is distinguished by two peculiar features. In the *first* place, the alphabetical method of arrangement, though scarcely an arrangement at all, in so far as it is not regulated by any natural principle or any bond of connection between the parts of a science, affords nevertheless facilities for consultation and perusal so great, that it is adapted to readers of every order,—those who have much time and those who have little,—and may be justly said to be by far the best method of acquiring in a short time a competent knowledge of any subject, in which reading alone will suffice. The second characteristic feature of works constructed on the alphabetical principle is, that, as they consist of a series of separate and unconnected essays written by different authors, the principle of the division of labour is carried to its greatest possible extent; and when the authors are judiciously selected, and the allotment of articles properly made, the work may be expected to consist of the best papers on each subject, since each article is likely to be composed by a person who has made the subject, if not his exclusive, at least, a very prominent part of study. The same circumstance tends powerfully to promote rapidity of publication; since many contributors can perform not only better, but in a much shorter time, the duty, which, in other circumstances, must have been undertaken by one or two authors.

It cannot be denied, on the other hand, that this species of publication is also subject to some disadvantages. As the arrangement is altogether arbitrary and accidental, it is unfavourable for communicating just or comprehensive views of the whole of any department of science, of the mutual relations of its parts, or of the minute bearings which each may have on the other. It is liable also to be unequal in the merits of the respective articles. Notwithstanding these drawbacks, however, the advantages are so considerable that, in the present state of science, when every subject is receiving daily accessions, modifications, and improvements, the alphabetical or dictionary mode of arrangement is the best calculated for embodying, with the already ascertained facts, all the new materials, and presenting a correct view at the time of the actual state of knowledge.

The application of this method to the science of anatomy and physiology presents similar advantages to those which it possesses on other subjects. Facility of reference, rapidity of publication, and the possession of a series of essays which ought to be presumed to be the most complete that the limits of the work can admit, with as great condensation as is practicable, may be regarded as the leading circumstances by which it is recommended to the regard of the profession.

With these views, principally, the present work has been undertaken; and we have now to consider, from the specimen before us, to what degree it is likely to form a useful and instructive digest of knowledge in anatomy and physiology.

The six numbers already published contain fifty-two articles on various subjects in anatomy, healthy and morbid, and physiology. Of these fifty-two articles, twenty-four are devoted to subjects in healthy and morbid anatomy, fifteen to subjects in comparative anatomy and zoology, three to subjects in physiology, three to subjects in pathology, and seven to subjects in animal chemistry and chemical physiology.

Any thing like reviewing formally essays on such a variety and extent of subjects is out of the question. All that we think it requisite to do is to take a general survey of the essays, to indicate the leading contents, and to advert to their general character. We shall take them according to their natural affinities, and not according to the order in which they succeed each other.

The first anatomical article on the Abdomen, by the editor Dr Todd, contains an excellent account of the natural boundaries of that region, of its walls or containing limits, and the anatomical arrangement and peculiarities of the abdominal *peritonæum*, of the action of the abdominal *parietes* and muscles, and a short general view of the abdominal cavity.

Of the second anatomical article, on the Adipose Tissue and its morbid states, by Dr Craigie, it will not be expected that any thing else than simple mention be made in this Journal, for very obvious reasons.

Two articles on the region of the Ankle and on the anatomy of the Ankle-joint, by Dr Brenan, present full and good views of both subjects. We cannot refrain from thinking, however, that the anatomical details, which are very nearly those of Cloquet and Velpeau, are here rather out of place. It appears to us that few will think of looking in the present work for the account of the bones and ligaments of the ankle-joint.

The article on the abnormal condition of the same joint by Dr R. Adams, gives a very excellent and correct view of the different displacements to which its component bones are liable, and of the morbid changes incident to its articular surfaces, and the respective bones.

The account of the *anus* and *anal region*, by Dr Robert Harrison, is a good specimen of the manner in which the anatomical constitution of that region, its relations, and the malformations and diseases to which it is liable, should be explained.

Under the article *aorta*, Dr Hart gives an instructive account of the origin, course, relations, and principal divisions of that vessel, a short sketch of its developement, an account of the principal anomalies in its course, and in the branches which issue from it, and a short view of its most usual morbid states; and in the second and third divisions of the paper, the author describes, *first*, the branches of the thoracic division, and, *secondly*, those of the abdominal division of the aorta.

The same author gives under the head *Arm*, a short account of the surgical anatomy of the thoracic or superior extremity, and of the muscular apparatus of which it consists; and under the title *Artery* a sketch of the general anatomy and the physical properties of that class of vessels.

In the next article, on the pathological conditions of arteries, Mr Porter gives a minute and accurate account of the effects of wounds and injuries of these vessels, and the manner in which reparation is effected, of the different diseases to which their texture is liable, and the varieties of aneurismal tumour to which their injuries or diseases may give rise.

Under the title of *Articulation*, the editor Dr Todd gives a short but accurate sketch of the general anatomy of the textures which enter into the formation of the joints, and describes the different forms of articulation presented by the mammiferous skeleton.

The relative anatomy of the *Axilla* or arm-pit, and of the Back, is minutely given by Dr Benson, under these respective heads; and we find the relative anatomy of the Axillary Artery explained by Dr Hart, while that of the *Vena azygos* is given by Dr Harrison.

The normal or healthy anatomy of the urinary bladder is given by Dr Harrison; and the abnormal anatomy, or that comprising the malformations and diseases of the organ, is treated by Mr Benjamin Phillips. In this instance, as in the two ensuing articles, the principle of the division of labour is carried to a very great length indeed. The sound and morbid states of the same organ, substance, and texture are treated by separate authors.

The essay on the healthy anatomy of the bladder is conceived and composed in a very philosophical spirit. The author begins with an account of the distribution of this organ in the animal world, and then proceeds to describe its site, figure, relations, and structure in the human body, and concludes with an account of the organization of the *viscus*.

In the account of the abnormal anatomy of the bladder, Mr Phillips distinguishes the morbid changes into those that are congenital and those that are acquired. Under the former he includes the malformations both as to number and to position; and under the latter head he considers all the other diseases to which the organ is liable in conformation, position, structure, and function.

To the normal and abnormal anatomy of bone two distinct papers by two different authors, Dr Benson and Mr Porter, are respectively devoted.

In the former article, Dr Benson gives a very minute and faithful account of the physical properties, and the internal structure of bone, of the nature of the periosteum and medullary membrane, as well as the marrow itself, with some views as to the uses of that substance, considers the organization of bone, its chemical composition, and finally, its peculiarities in the different classes of animals.

The essay by Mr Porter on the abnormal conditions of bone gives a good account of several of the morbid states of that substance. But we confess that we expected to find a more satisfactory account both of Necrosis and *Spina ventosa* than we here see.

We acknowledge that we think that, on the former subject, some of the observations more recent than those of Mr Russell, most of which are second-hand, might have been adduced. The views of Dr Thomson are never mentioned; and those of Mr Liston and Mr Syme are passed over in equal silence. In short, on the subject of necrosis, we must acknowledge our inability to understand Mr Porter. The following proposition, with which he concludes his observations on this disease, seems a little singular. "Thus far," says he, "it will be seen that we have considered necrosis as a disease distinct and different from every other affection of the bones whatever, and that its chief and most marked characteristic is the process of regeneration." Now, we must say that this statement appears to us not very consistent with the present state of pathological knowledge Instead of regeneration being the chief and most marked characteristic, we should think that the death of the bone is the most marked characteristic. Is not the regeneration the consequence, or, to speak more strictly, the subsequent event of the death of the bone; and is not the latter circumstance always the first and essential character of the disease? Without previous death of the bone there is no reproduction. It is very true that the term *necrosis*, though signifying properly death of the bone, has been made by implication to include also the regeneration which, in ordinary circumstances, follows. But it may happen that regeneration does not follow, and such we have seen to be the case; and yet we should not, it appears to us, be justified in withholding from these cases the denomination of necrosis.

As little can we reconcile with the results of our own observation the succeeding remark on the constitutional effects of necrosis. "Regarded in this point of view," that is, as a process of regeneration, we presume, "it is as much, and even more, an action of health than of disease; and it can easily be understood why the constitution suffers so little,—why the hectic fever is of so mild and mitigated a form,—and why in a simple and uncomplicated case recovery is nearly certain." Now, to us this appears to be a very singular mode of contemplating the subject. Here is a fact, which is at best doubtful, assumed as well established, and an explanation offered as if it were established. Mr Porter must have been much more fortunate than we have been if he has seen the constitution suffer little, and the hectic fever assume so mild a character in necrosis; and still more fortunate if his experience leads him to regard recovery "as nearly certain." We have been so unfortunate as to see most severe disorder of the constitution in most cases of necrosis; and certainly the hectic, after it was fully established, by no means milder than in other wasting diseases; and we regret to say, that we have now several times within the last eighteen years seen the disease produce so dreadful an impression on the system, as to terminate fatally before reproduction was completed; and we have known experienced surgeons so apprehensive of this result, as to recommend and perform amputation of the limb rather than incur the risk of a similar issue.

Under these circumstances, it cannot be astonishing that we decline assenting to the doctrine so coolly promulgated by the present author, that *Necrosis* is to be viewed more an action of health than of disease. We believe there are few patients in this disease who would become converts to this opinion, or be reconciled to the idea that they were in a state of perfect health, when the leg or thigh had two or three fistulous openings discharging purulent matter copiously, when the whole limb was swelled beyond all ordinary bounds, and when fragments of dead bone of various size were coming away from the openings, sometimes with great pain and difficulty, and sometimes after severe and painful operations; and when the prospect of the patient was divided between the chance of lying in bed for months or even years, and finally moving about a miserable cripple; or being obliged to have the limb removed, in order to insure the preservation of life. Even when the process of reproduction is apparently completed, the patient is never safe. A small portion of the old dead bone, or a feeble and tender portion of the newly formed one may create, after some years, so much disorder and irritation, as to bring the patient to the grave in the course of a few days. We knew well a gentleman, who had been in youth the subject of necrosis of the thigh-bone, and in whom all the serious part of the disease had for many years so completely subsided, that, though quite lame in the affected limb, he was able to conduct the details of a laborious and extensive business. From some cause not well understood, unless it were a fall in his bed-chamber, the disease resumed, after the lapse of twenty years, an active character, indicated by much pain and swelling of the limb, with intense general fever. In the course of ten or twelve days, when the discharge, which had been at first suppressed, was restored, it was thought right to attempt to ascertain the state of a supposed portion of dead bone, and attempt to remove it. The attempt was made without success. By this proceeding the symptoms were not aggravated, but they were not mitigated; the general febrile disorder proceeded. The pulse became small and feeble, with hectic exacerbations; the tongue dry, red, and glassy; the features shrunk and contracted. Delirium came on, and he died about the 22d day after the first invasion of the symptoms.

In the account of *Spina Ventosa*, we perceive that Mr Porter has chiefly followed the method and distinctions of Boyer. This it would be unreasonable to blame; and it may be observed, that if the account is less satisfactory than might have been expected, the subject is one of peculiar obscurity and difficulty, and upon which the opinions of surgeons and pathologists are both contradictory and unsettled. Though Mr Porter nowhere gives a specific definition, we are given to understand that, "the separation, or rather the expansion of the solid walls of a bone leaving within it one or more cavities, which, during the patient's life were filled with a secretion that presents considerable variety in different cases, sometimes possessing a moderate degree of consistency, but more frequently consisting of a fluid of a serous character and reddish colour,"—"is the disease to which we apply the name of *spina ventosa*, in contradistinction to abscess within a bone, from which it differs in its extremely chronic nature and tedious progress; in its not containing purulent matter; in its having no tendency to burst into any contiguous joint; and (until at a very advanced period) in its not being complicated with caries."

This, which is allowed to be partly taken from the *Dictionnaire des Sciences Medicales*, we know to be something like what has been believed, rather confusedly, to constitute *spina ventosa*. But we do not see, that because it is the ordinary, and perhaps the current definition, it is therefore to be given in a work in which it is proposed to settle the doubtful, to illustrate the obscure, and to rectify the erroneous. Of the numerous authorities who have attempted to illustrate this department of surgical pathology, all agree in the expansion; but on the cause of that expansion they are extremely discordant. Paul Ammann, Pandolphinus,[*] and some of the early authors, appear to have regarded this cause as a corrupting abscess (*abscessus*

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[*] Dissertatio de Spina Ventosa. Lipsiae, 1672.

corruptorius,) or mortification of the bone. But it is evident that they confounded under this name several maladies essentially different, for instance, *necrosis*, *caries*, and even venereal nodes. Cornelius Trioen, an eminent surgeon at Leyden, endeavoured in 1743 to fix the meaning of the term, by representing it to be expansion of the surface and of the substance at the same time, with uniform loss of substance, by which, he says, it is distinguished from exostosis, in which there is deposition of new solid matter. * This view was, at the distance of fifty years, adopted by Soemmering, who represents a bone when affected with *spina ventosa*, to swell or become inflated, to be attenuated, and to be diminished in weight, † and refers to the instance of the femur, which Trioen delineates as a good example of the disease. The learned editor of the treatise of Duverney, in a preface of considerable ability, informs his reader that, "the corruption of the *medulla* without external wound, or produced by an internal cause, is generally called *spina ventosa*; a name, he adds, which has been applied on account of the corrosion and destruction of the bone, accompanied with pungent pain and swelling." ‡ We have on former occasions pointed out the remarkable mistake of our countryman Amyand, who gave and delineated for examples of *spina ventosa* several very good cases of *necrosis*,—an error which was evidently favoured by the doctrines of the day, and by the unsettled and contradictory opinions maintained on this disease. It is important to observe, that the same error was committed by Cheston, who refers to the cases of Amyand as good examples of the disease. §

By an author who has evidently devoted considerable attention to this subject, and whose work we perceive is mentioned in the bibliography of the present essay, the definition is derived rather from the supposed cause, than from the actual effects and phenomena. Frederic Ludovic Augustin, the writer to whom we allude, represents *spina ventosa* to consist "in internal inflammation of a bone with swelling, which is general in the case of a small bone, but partial in that of a large one, causing most acute pain, ending eventually in swelling of the soft parts, not unfrequently in fistulous ulcerations and open caries, by means of all which, he adds, the affected bone is converted into a monstrous irregular tuberous mass, of hard or greatly corrupted structure." It is a proof of the extreme difficulty of framing a definition quite unobjectionable, that, while Augustin tells us that he rejects the circumstance of abscess, because he had seen *spina ventosa* very often *(multoties,)* without any,—certainly without great,—erosion of the bones; yet he begins his definition by the terms, *inflammatio ossis interna*, and before he gets through it, he adds, *desinens haud raro in exulcerationes fistulosas cariemque apertam.* It must be gratuitous to direct attention to the inconsistency of denying the presence of abscess, when he admits the presence of inflammation, unless abscess means something else than a consequence of inflammation;—while he allows caries to be a termination of the disease, yet denies the occurrence of erosion.

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* Cornelii Trioen, M. D. Observationum Medico-Chirurgicarum, Fasciculus. Lugduni Batav. 1743.

† De Corporis Humani Fabrica, Tom i. p. 89. §. lxxxii.

‡ Traité des Maladies des Os. Par M. Duverney, Doct. Med. Preface, iii. p. clviii. Paris, 1751.

§ Pathological Inquiries and Observations. Gloucester, 1766. 4to, p. 117.

The foreign authors, as Soemmering, Walter, Sandifort, Voigtel and most of the German pathologists, have in general adopted the views of Trioen. But the preparations in the museum of Walter, with the observations of Augustin, induced Voigtel to attempt a modification, and to distinguish *spina ventosa* into two varieties. In the first, the outer surface of the bones is rough, tuberculated, and raised into spiculae and teeth; the bulk is increased, but in consistence it may either be natural or harder than usual; and commonly such bones are heavier than healthy ones. Their cavities and cells are filled with osseous matter, so as to give them the appearance of being solid throughout. In the unaffected parts the medullary cells are natural, but the bones are usually wasted. This species, he adds, very seldom passes into suppuration, and he thinks it depends on corruption of the soft parts surrounding the bone, not the bone itself.

The second species of *spina ventosa*, according to Voigtel, is that in which the affected bone presents a more bladder-like appearance, is less hard, swells outward unequally, and more frequently and easily passes into suppuration. As an example of this species, he adduces one of the specimens delineated by Augustin from the museum of Walter (N. 419,) and which took place in the lower half of the left *femur* of a female aged 30. In this case, the bone was so much extruded that its circumference measured eighteen inches. It was completely like a bladder, and everywhere perforated, so as to give it a honey-comb appearance. The anterior surface was quite rough, irregular, and covered with bony spiculae and patches.* The essential characters here given are adopted by Meckel,† with the exception, that he regards *paedarthrocace* or the disease of the phalanges of children, as of the same character, and differing only in degree.

These facts, the number of which could be easily increased by referring to the doctrines of Monteggia, Callisen, Chelius, and other foreign surgeons on this point, are sufficient to show that the cases referred to the head of *spina ventosa* are so different and dissimilar in many respects, that no uniform doctrine is taught on the subject. The whole subject, indeed, would require to be revised and investigated anew, in order to frame any accurate or trustworthy conclusions. The great secret of the confusion is this fact, that previous to the period when David, Troja, and Weidmann investigated and illustrated the nature and causes of necrosis, many cases believed to be *spina ventosa* really belonged to the head of necrosis; and consequently all the descriptions which have been made with a view to the cases of this class are absolutely worth nothing, and must in the eye of strict reason be rejected.

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* Handbuch der Pathologischen Anatomie, von Dr F. G. Voigtel. Halle, 1804. Erste Band, ii.ter Abschnitt, p. 146.

† Handbuch der Pathologischen Anatomie, von J. F. Meckel. Leipzig, 1816. Zweiter Band, p. 269.

On another point in the history of this disease we find that Mr Porter has not been able to arrive at any positive conclusion. We allude to the question of its malignancy. He is rather inclined to regard it as void of this property, but remarks, that if by the term malignant be meant a disease which may prove destructive to life and limb it may occasionally lay claim to the title. On this point we find authors are quite as discordant as upon any other. Most of the foreign surgeons regard it as void of malignancy.

The objections now stated are to be viewed perhaps as defects in the present state of knowledge. In directing attention to them we are desirous to show the necessity of some accurate researches on this subject.

In the concluding part of the article we find exostosis, osteosarcoma, and the different forms of cancer ably explained.

In the next article the relations of the brachial or humeral artery are accurately given by Mr Hart; and under the head of *bursæ mucosæ* Dr Brenan gives an instructive view of the general anatomy and the pathological conditions of the synovial sheaths.

Under the title of carotid artery Mr Hart describes the origin, course, relations, and distribution of that vessel and its branches; and in a supplement Dr Todd, the editor, gives an interesting view of the effects of applying ligatures to the vessel upon the nervous system. To these effects we had occasion in our 43d volume, when speaking of the experiments of Professor Mayer, to direct attention. The observations in the present article in general agree with the conclusions to which we had occasion to direct attention. In noticing the case by Dr Mussey of ligature of both carotids within twelve days of each other in the same patient, Dr Todd might have added that the same operations were performed by Mr J. R. Preston, of the Honourable

East India Company's Service, as mentioned in the article now referred to.

A useful account of the general anatomy of cartilage, and the part which its morbid susceptibilities perform in disease, is given by Dr Benson.

Under the head *Cavity* Dr Todd gives a description of the boundaries, extent, and division of the cavity of the *Abdomen* only. The cavities of the head, chest, and pelvis are respectively referred to the articles *cranium*, *thorax*, and *pelvis*. This appears to be an unfortunate effect of the accidental mode of arrangement; as it is manifest either that the present article would have been, upon the principle now recognized, more properly under the head abdomen; or that the account of the different cavities should have gone together. This is suggested by principle. But we are aware that editors are beset with many difficulties, which cannot fail to make them occasionally neglect arrangements, which they had determined otherwise to observe. The article is otherwise good, and contains not only some observations upon the developement of the cavity and its dimensions at different periods, but a short and useful sketch of the malformations and diseases to which it is liable.

The article on cellular tissue by Mr Grainger gives a respectable view of the anatomical properties of this substance and the morbid conditions to which it is liable, and in which it performs a part. Some of the physiological remarks might have been dispensed with.

From the subject of Human Anatomy, Normal and Abnormal, we willingly pass to the more interesting one of Animal Anatomy in general. In this department we are happy to perceive that the numbers already published are rich, both in number and extent, of the subjects treated, and also in the manner in which they are treated. The articles on Comparative Anatomy are indeed of a very superior order, and bear evident proof of much ability as well as great accuracy. These articles are in number fifteen, and are the following. *Acalephae*, the sea nettles, by Dr Coldstream; *Acrita* by Mr Owen; *Amphibia*, *Carnivora*, and *Cheiroptera* by Mr Thomas Bell; *Animal Kingdom* and *Chyliferous System* by Dr Grant; *Animal* by Dr Willis; *Annelida* by Dr Milne-Edwards; *Arachnida* by Dr Audouin; *Articulata*, *Aves*, and *Cephalopoda*, by Dr Owen; *Cetacea* by M. F. Cuvier; and *Cilia* by Dr Sharpey. We can only refer to a few of these articles.

That on the sea nettles (*Acalephæ*) is very well done, and the able and interesting manner in which it is written reflects great credit on Dr Coldstream.

The author, after some observations on the general characters of these singular and by no means uninteresting animals, distinguishes them, after the manner of M. Blainville, into five groups, or tribes. I. The *Physograda*; II. the *Diphyda*; III. the *Ciliograda*; IV. the *Pulmograda*; and V. the *Cirrigrada*, with their tribual characters, and the names of the genera included by each. He then enters into the detailed account of their structure under the several successive heads of, 1. organs of locomotion or impulsive progression; 2. organs of mobility and sensation; 3. organs of digestion; 4. organs of circulation; 5. organs of respiration; 6. organs of secretion: 7. organs of reproduction; and 8. their geographical distribution.

The whole essay is written in a philosophical spirit of precision, and will be perused with much interest by every physiological reader who wishes to carry his inquiries into the functions of the animal creation in its most curious recesses. The following observations upon the stinging property possessed by several of the animals of this order, which are given under the head of secretion, will be interesting to the pathological reader.

" The stinging property possessed by several animals of this class has been the subject of inquiry since the time of Aristotle; but to this day we remain in doubt with regard to the nature and mode of production of the agent which causes this effect. Some men seem to be insensible to the irritation generally produced by the contact of living *Acalephae*. But for the most part a slight touch of any part of their surface, and chiefly of the pendent *tentacula*, is followed within a few minutes at most, by burning pain, redness, swelling, and sometimes even venesection, of all that portion of the skin which touched the animal. Sloane said of the *physalus*, (' what the seamen call caravels, or Portuguese men of war,') they burn violently. They do suit themselves so close to the skin, that they raise blisters, and cause sometimes St Antony's fire.* Even on our own coasts, severe cases of inflammation of the skin are occasionally seen, which have been produced by the irritation received during bathing from some of the larger *pulmograda*. In the *physalus*, the stinging property seems to reside chiefly in the fluid with which the tentacula are filled. It continues to act powerfully, even after the organs containing it have been detached from the body. And not only so, but it is said by some observers that its peculiar properties are so permanent, that vessels in which the animals have been placed, must be washed several times in water, and carefully scoured, before they can be used without inconvenience. On one occasion, it was found that linen, which had been merely rinsed in soap and water, had this quality of irritation fifteen days after it had been used in making observations on the physalus. None of the Cirrigrada hitherto examined possess the stinging property."—P. 45.

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* Natural History of Jamaica, ii. p. 273.

Under the title *Acrita*, Mr Owen gives a short general account of the characters of that division of animals after M. Virey and Mr Macleay. This division had been placed by Cuvier under the head *Radiata*; but the animals referable to the head now mentioned differ so widely from the other genera of that division, that the necessity of erecting them into a distinct order or class, has been long felt by the most experienced and accurate zoologists. The character of the class is the circumstance of the nervous system being only in very indistinct traces, or in being so invisible, that it is presumed rather than known to exist. The animals possessing the characters now mentioned are the polyastric *Infusoria* of Ehrenberg, the *Polypi* of Cuvier, the *Entozoa parenchymatosa* of Cuvier, or *Sterelmintha* (solid worms,) and the *Acalephae*, or sea-nettles or jellies. Mr Owen gives the characters modified from those given by Macleay.

Under the title *Amphibia*, Mr Thomas Bell has furnished an excellent account of the anatomical structure and several of the most important functions of that class of vertebrated animals. Rejecting the usual divisions given of this class of animals as unsuitable, Mr Bell distinguishes them into five orders; I. the Amphipneurta, including the *proteus*, *siren*, &c.; II. the Anoura, embracing the frog, toad and allied genera; III. the Urodela, including the salamander and allied genera; IV. the Abranchа, consisting of the Menopoma and Amphiuma, which have not yet been observed to possess *branchiæ* at any period of their existence; and V. the Apoda, consisting of the *Caecilia* only. The author then treats of the anatomical structure of these animals, under the several heads of osteology, muscular system, digestive organs, the lymphatic and lacteal system, the sanguiferous system, the organs of respiration, the nervous system, the organs of vision, hearing, smell, and taste, then the function of transpiration and secretion by the skin, the phenomena of the repair of lost parts, the function of reproduction, and finally, the history of the process of metamorphosis.

The article is ably written; the descriptions are given in a clear and interesting manner; and we recommend it as one which will amply reward the labour of perusal.

Under the article Animal Kingdom, Dr Grant gives a general view of the characters by which the different orders and classes are distinguished, beginning at the lowest, and ascending gradually to the vertebrated animals; and Dr Willis is the author of an able and philosophical view of the physical and physiological characters pertaining to the animal world generally.

The article *Annelida* contains an account of the anatomical structure of the annulose order of animals by D. H. M. Edwards.

In the article entitled *Arachnida*, M. Audouin gives a full and very interesting account of the spider-like tribe of animals.

The author, after presenting the tabular view of the different families and genera of these animals, as improved by M. Walckenaer, treats, first, of the anatomical structure of their external covering, then describes the digestive organs, and the alimentary canal; next the organs of respiration and circulation; then the nervous system, with the organs of sense; then considers the apparatus for secreting the irritating or poisonous liquid, by which these animals destroy their prey, and the fluid which concretes in the air to form cob-web and gossamer; then the reproductive organs, male and female; and concludes with an interesting sketch of the process of developement of the ova, the process of metamorphosis or moulting, to which these animals are annually liable, and the reproduction of the extremities.

Under the title *Articulata*, Mr Owen gives a short sketch of the characters of the several divisions of that class of animals.

The article *Aves* by the same contains a full, accurate, and elaborate account of the anatomical structure presented by the various tribes of birds. To the comparative anatomist this is an article of great value and interest.

The same author has given a very excellent account of the singular varieties in structure presented by the organs of the different species of Cephalopodous Mollusca. The descriptions are illustrated with many spirited and accurate woodcuts.

The anatomical peculiarities of the *Carnivora* and the *Cheiroptera*, by Mr Bell, are given with his usual clearness and accuracy.

The article on the *Cetacea*, which is partly by M. Frederic Cuvier, with additions from the notes of Mr John Hunter, has rather a party-coloured appearance. It is therefore rather unequal, but it seems to contain all the information at present accessible on the structure of that family of animals.

The last article in the present part on comparative anatomy, is that on *Cilia* of various animals, and the motions to which they contribute, by Dr Sharpey. This is an essay of very great learning and ability; and shows that, while Dr Sharpey is well acquainted with the researches of foreign anatomists, both departed and still in life, he has studied by personal observation and experiment, not only to verify the doctrines of these philosophers, but to furnish himself much additional valuable matter.

The following extracts will give some idea of the conclusions at which Dr Sharpey has arrived regarding the applications to be made of the discovery of the existence of ciliary motions in the higher class of animals.

"*First,* Three cases have been already mentioned in which currents, more or less resembling those produced by cilia, take place on surfaces on which cilia have not been detected; these are the currents in the Sponge, those of the Tubularia indivisa, and those within the stem and branches of Sertulariæ. In regard to the Sponge, it is true that cilia have been diligently sought for and without success; still, considering the difficulty of the investigation, it is not impossible they may exist in some part of the passages through which the water runs, though not yet discovered, especially as the ova possess evident cilia. With respect to the currents described by Mr Lister within the stem of the Tubularia, it will be seen, on referring to the account of these, that farther observations would be required to settle the points here in question, viz. whether the floating particles receive their impulse from the surface over which they move independently of any contraction of the stem, and whether or not that surface is covered with cilia. To decide these points satisfactorily it would be necessary to lay open the tube and make trial of detached portions of the tissue as in other instances. The same remark is in a great measure applicable to the currents in the stem and branches of Sertulariæ. Indeed both instances have been described above only because of their seeming analogy with the rest, but further investigation is still required to determine their true nature. Neither these, therefore, nor the Sponge afford unequivocal examples of the peculiar motion of fluids alluded to taking place independently of cilia. Of course we may pass over without notice the cases in which the appearance of the moving cilia has been mistaken for a circulating fluid, or ascribed to other causes than the real one, and their existence erroneously denied.

"*Secondly,* It is well known that in cold-blooded animals the blood continues to move in the capillary vessels for some time after the heart has been cut out. This motion for the most part goes on at first steadily from the smaller to the larger vessels in the arteries as well as the veins, and afterwards becomes oscillatory. Haller, who particularly investigated the phenomenon, was of opinion that it could not be attributed to contraction of the large vessels, to gravitation, nor to capillarity; he therefore attributed it to some unknown power which he conceived to be exerted by the solid tissues on the blood and also by the globules of blood on each other, and to this power, until farther investigation should elucidate its nature, he gave the name of attraction. The same opinion or a modification of it has been taken up by succeeding physiologists; accordingly many maintain the existence of a peculiar propulsive power in the coats of the capillary vessels different from contractility, or that the globules of blood are possessed of the power of spontaneous motion. Among others, Dr Alison has adopted and extended this view in so far as he regards the motion of the blood in the capillaries as one of the effects produced by what he calls vital attraction and repulsion, powers which he conceives to be general attributes of living matter, or at least to manifest themselves in other processes of the living economy besides the capillary circulation.

"The motion in question has certainly not been as yet satisfactorily accounted for by referring it to the operation of known causes. At the same time we can scarcely admit that the influence of such causes has been wholly avoided in the experiments in which the phenomenon has been observed. It is not impossible, for example, that a certain degree of agitation may be occasioned in the blood by the elastic resilience of the vessels reacting on it, after the distending force of the heart has been withdrawn. The necessity of the case, therefore, though great, seems scarcely such as alone to warrant the assumption of a peculiar attractive or repulsive power acting on the blood at sensible distances, of whose existence in the animal economy we have as yet no other evidence. It may be remarked, finally, in regard to the phenomenon alluded to, that it cannot properly be termed a continuance of the circulation, for the blood does not necessarily preserve its original course, nor indeed any constant direction. (See CIRCULATION.)

"*Thirdly*, In several plants motions have been observed in the fluids which are contained in their cells or vessels in determinate directions, and seemingly independent of any contraction of the parietes of the containing cavities. The best known example of this is in the Chara. Its jointed stem consists of a series of elongated cells, which contain a clear fluid with globules suspended in it. The globules are moved up one side of the cell and down the other in continual circuit. No contraction can be perceived in the parietes of the cells, which are indeed of a rigid texture, and this mysterious movement has therefore been ascribed to some unknown and invisible impelling power. It is doubtful, however, whether the motion can go on unless the cell is entire, the experiments of different observers on this point being contradictory, and it certainly has never been shewn that separated portions of the tissue continue to excite the motion. In this state of knowledge on the subject we can scarcely admit this or similar motions of vegetable juices as unequivocal examples of the operation of an impulsive power of the kind referred to; and even on the contrary supposition it does not follow that such a power exists in animals.

"On the whole, therefore, from what has been said regarding the several examples adduced, we may conclude that they do not afford unequivocal evidence of visible motions being produced in fluids in the animal body, independently of contractions of containing solids or of the action of cilia; and, consequently, that viewed in reference to the ciliary motion, they form no adequate reason for doubting that the fluid is moved mechanically by cilia.

"I may conclude this article by observing, that though the general existence of the ciliary motion in the Animal Kingdom is already sufficiently established, yet many particular instances of it must still remain to be found out, especially in invertebrated animals; and whoever has opportunities and inclination to cultivate this field of inquiry will find his labour rewarded by much curious and interesting discovery."

Among the physiological articles, it appears to us that the essay on Age is in this work rather in a false position. At all events, it must be pretty clear, that, if an article on that subject were requisite, the present is scarcely the one which should be expected to answer.

Of the chemico-physiological articles, the essay on the healthy and morbid characters of the blood is most entitled to attention. The first part is by D. H. M. Edwards, but might have been by any one moderately acquainted with the subject. The second part, by Dr Babington, gives a very fair view of the morbid conditions incident to that fluid.

Our limits will not permit us to enter into greater detail in the examination of this voluminous and elaborate work; and we must be satisfied with a general recommendation of the work as one, which is likely, if continued in its present style, to be of very great use to the profession, especially its junior members. That it is faultless, or in every respect excellent, we cannot conscientiously say. Several of the articles present weak points, which indicate defect of research, or indifference to precision and disregard to condensation; and in one or two articles, we find less full information than we were led from the character of the authors to expect. Notwithstanding these objections, however, which are mere specks amidst much excellence, the work promises to be one of very great value, and will no doubt be highly useful. Its redeeming features evidently reside in the department of comparative anatomy, the articles on which alone would be sufficient to recommend it to public patronage. These articles are extremely valuable in every point of view, in clearness, in information, and general interest;—and their diffusion among the profession in the present form will disseminate a taste for a particular species of knowledge of the greatest use to the physiologist.

The appearance of a work containing information of this kind makes us feel, that we live in a different age almost from that of the time, at which we were initiated in the elements of professional knowledge. At that time the knowledge of comparative anatomy was limited; the subject was cultivated by few; and the means of acquiring any information of it were confined to still fewer. The existence of a work like the present would then have been of incalculable benefit. At present it must be regarded almost as constituting a new era in medical education.

ART. V.—*A Report on Small-Pox as it appeared in Ceylon in 1833–1834; with an Appendix.* By J. KINNIS, M. D. Superintendent of Vaccination in the Colombo district. Published by order of the Right Honourable the Governor and Council. Colombo, 1835. 8vo. Pp. 88.

FROM this report it appears that the question regarding the identical origin and the sameness in contagious principle of small-pox and chicken-pox is as far from being determined as ever. Dr Kinnis thinks that, among other points, the epidemic of Ceylon afforded clear evidence that small-pox depends upon a different contagious principle, and is a disease generically distinct from chicken-pox.

We shall first consider the facts adduced by the author, so far as our limits will permit, and we shall then place before our readers the conclusions which he deduces.

In the year 1833, cases of small-pox appeared almost simultaneously in three distinct parts of the Island of Ceylon, viz. in Colombo, at Jaffna, and at Nuwera Ellia.

1. At Nuwera Ellia, which is considerably in the interior, one case appeared early in November 1833, (about the 3d,) in a native residing in a shed belonging to a soldier of the 78th Regiment, three miles from the barracks. It was stated to be a mild and modified but well-marked case of small-pox. Many more are said to have afterwards occurred among the natives; but none other were reported to the superintendent of vaccination till the month of May 1834, during which 12 persons, 10 of whom had been vaccinated, were attacked. The disease was mild, and not more severe in the two unvaccinated than in the ten vaccinated subjects. The cases were referred by the attending medical officer to the conoidal *varicella* of Willan, or modified small-pox.

2. The first known case in the Jaffna district, which is situate on the coast at the northern extremity of the Island, occurred in a boy who landed at Cayts from the coast, sometime in October, and who recovered before the fact was known. The first case seen by a medical officer occurred at Wellywittytora, near Point Pedro, the northern extremity of the island,—about if not on the same day as the first case at Nuwera Ellia, (3d November,) but was not discovered before the 11th of that month. After this the disease proceeded slowly, attacking one or two at a time in the village of Point Pedro. But the cases were concealed, and none were detected till the 28th December, between which time and the 10th of January nine cases occurred, in February a tenth case, and in March an eleventh, making a total of twelve cases. Every case on discovery was removed to the small-pox Hospital at Jaffna.

In August 1834, the disease reappeared at Pooneryn, near Jaffna, and produced 46 cases, making in all 58 since October 1833. Of these 40 were returned under small-pox, 8 under modified small-pox, and 10 under chicken-pox. On the 23d December 1834, the period of the report, 10 cases had terminated fatally, and 8 were under treatment, all of which recovered.

3. The first case discovered near Colombo was that of a Moorman, who asserted that he had landed about the 14th October at Galle, in a Nagore Dhoney from Madras; that at the end of four or five days, having set out for Colombo, he had been attacked on the road with fever, and with the small-pox eruption on the 26th October; and that being friendless in Colombo, he had taken refuge in New Moor Street Mosque, where he was discovered by a medical sub-assistant on the 1st of November. The statement as to landing at Galle was afterwards contradicted by information thence, which proved that no dhoney had arrived in that harbour from Madras or its vicinity since June. He was removed to the Pettah Hospital on the 2d.

The history of the second case was better ascertained. A boy, 12 years old, in the service of a Mahomedan priest, who had brought him from Cochin in a three-masted vessel on the 17th October, after a passage of four days, was attacked with fever on the 28th October, and was discovered in his master's house in Old Moor Street on the 5th of November, and was the same day removed to the Pettah Hospital with the eruption upon him. A female servant in the same house, who had been vaccinated, was attacked on the 16th November, and was removed on the 18th to the Pettah Hospital.

During the next forty days, from the 18th November to the 28th December, no new case occurred from without. But nine cases occurred in the Pettah Hospital itself, and ten cases in other parts of the Pettah and suburbs. After this time the disease proceeded in the usual way, prevailing chiefly in certain localities, especially 1st. Cross Street, the Bazaar, Fisher's quarters, and Land Street, where it respectively attacked 29 persons, 30 persons, 48 persons, and 38 persons.

The total number of cases which occurred during the epidemic, from the 24th of October 1833, to the 29th November or the 23d December 1834, amounted to 713. Of these 114, or 1 in 6¼ died; and of 114 fatal cases, 111 were returned under the head of small-pox, one under that of modified small-pox, and two under the head of chicken-pox.

The case of modified small-pox occurred in a child a year old in the Pettah, who had been vaccinated shortly before unsuccessfully, and who was labouring at the time of the attack, under anasarca and Malabar itch. The small-pox eruption was distinct and easily distinguished from that of itch. Death took place the same day on which the case was discovered, and is ascribed to the disease under which the child was previously labouring.

The first fatal case returned under chicken-pox occurred in a female who had been successfully vaccinated, who was received into the Chicken-pox Hospital in Kandy with slight symptoms of varicella, and who died of acute dysentery on the 23d. The second occurred in a man of 65, who had never been vaccinated, and who was admitted into the Marandahn Hospital on the 3d November, with chronic dysentery, which proved fatal on the 12th of the month.

Of the residual numbers, Dr Kinnis gives a statement to the following effect. There were 425 cases of small-pox and modified small-pox; of which 111 had been successfully vaccinated, and 2 died, or 1 in $55\frac{1}{2}$; 86 bore either no marks, or unsatisfactory marks of vaccination, and 19, or 1 in $4\frac{55}{100}$ died; and 228 had never been vaccinated, and 88, or 1 in $2\frac{59}{100}$ died. This gives a total mortality of 109 in 425 cases, or 1 in $3\frac{9}{10}$.

From these facts Dr Kinnis thinks he is justified in concluding; 1*st*, That had the whole 425 patients been vaccinated, the mortality would have been as 1 to $55\frac{1}{2}$, or 8 only; 2*d*, That if these 425 patients had borne either no marks or unsatisfactory marks of vaccination, the mortality would have been as 1 to $4\frac{55}{100}$, or 94 only; and 3*d*, Had the whole 425 never submitted to vaccination, the mortality must have been as 1 to $2\frac{59}{100}$, or so high as 164. He infers, therefore, that by vaccination, the lives of 164—109, or 55 persons were actually saved; and that by the same means, the lives of 109—8, or 101 persons more, making 156 in 164, might have been saved during the epidemic of 1833–34.

From a table of the days on which 107 cases of small-pox terminated fatally, it appears that 11 died on the 6th day, 10 upon the 11th, 9 upon the 10th and 12th, 8 upon the 8th and 13th, and 7 on the 14th day; that during the first week the total deaths were 24, during the second, 57, and during the third, 16. The greatest number of deaths, therefore, takes place between the 7th and 15th days, or more than one-half died during the second week; less than one-fourth of the whole died during the first week; and rather more than one-seventh died during the third week.

The ages at which the respective numbers of deaths took place were the following. Of 228 cases of reported small-pox, and of 88 cases which terminated fatally, the ages were as follow.

	Attacks.	*Deaths.*	*Proportion.*
Above 40	23	14	1 in $1\frac{9}{14}$
Between 40 and 21	72	38	1 in $1\frac{17}{19}$
20 and 16	20	9	1 in $2\frac{2}{9}$
15 and 11	28	2	1 in 14
10 and 6	33	3	1 in 11
Below 6	52	22	1 in $2\frac{4}{11}$
	228	88	

The highest rate of mortality in this epidemic, therefore, appears to have taken place in persons above 40, and between the ages of 40 and 21; and the lowest was between the ages of 11 and 15, and between 6 and 10. Below 6 years of age, and between 16 and 20 years, it appears to have been nearly the same.

Lastly, Dr Kinnis thinks, and adduces a long train of evidence to prove, that the experience of the epidemic showed, that it is impossible to adopt the hypothesis, that small-pox and chicken-pox are merely different degrees of the same disease; and he feels himself obliged to adopt the conclusion, that the febrile eruptive disease known in Ceylon by the name of chicken-pox arises from an infectious matter essentially different from that which produces small-pox and modified small-pox.

The principal arguments in favour of this opinion are, 1*st*, That, with the exception of two cases said to be imported, small-pox appears to have been unknown in Ceylon from 1810 to 1819; yet during that interval not a year elapsed without the appearance of chicken-pox in a sporadic or epidemic form. 2*d*, In the epidemic of 1833–34, though chicken-pox prevailed, small-pox appeared, attained its height, declined and terminated earlier than the chicken-pox.

We doubt whether these arguments, and the facts contained in the present publication, though collected with great labour, are quite adequate to establish the conclusion already stated. At all events, it is evident that the following circumstances would require to be considered. It the *first* place, the disease appeared in three distinct points of the island at the same time, and almost on the very same day. In the *second* place, the cases which appeared at Nuwera Ellia were referred by the medical officer who reported them to the head of the conoidal chicken-pox of Dr Willan, or modified small-pox. And *thirdly*, in the Ceylon Rifle Regiment at Colombo, there occurred 45 cases which were reported by the surgeon as instances of purely vesicular chicken-pox, with one mild case of what was regarded as small-pox, during the period at which small-pox in its virulent form was prevalent among the natives and unprotected.

We recommend, however, a careful perusal of the report and its elaborate appendix, which reflects the highest credit on the diligence and perseverance, as well as the accuracy of Dr Kinnis.

PART III.

MEDICAL INTELLIGENCE.

MEDICAL PATHOLOGY AND THERAPEUTICS.

Case of Pulmonary Consumption induced apparently by a bone slipping down the Windpipe, and sticking in the bronchi. From M. Schroeder van der Kolk's Observationes Anatomico-Pathologici, &c. 1826, Amstelodami. By Dr Craigie.—I sometime ago adduced [Ed. Med. and Surg. Jour. vol. xlii.) a number of instances in which foreign bodies had been allowed to pass into the windpipe, and to give rise there and in the larger bronchial tubes to such a degree of bronchial irritation and inflammation, as to imitate closely all the symptoms of consumption, and threaten for a considerable time to bring the patient to the grave. In the cases then adduced, I showed that there was reason to believe from the respective results that bronchial inflammation in different degrees of intensity, but always becoming chronic, had been the lesion induced. In the following instance, which is recorded by M. Schroeder van der Kolk, an accident of this kind seems to have induced pulmonary tubercles and genuine pulmonary consumption.

A young woman of 26, who had been under treatment in the Amsterdam Hospital for a severe nervous catarrhal fever, but from which she had perfectly recovered, left the hospital quite well, and free from any complaint of the chest. A short time after, when eating some soup at home, a small bone dropped into the windpipe, and immediately gave rise to cough and anxious breathing, but without the bone being rejected. After the lapse of some time the anxiety was abated, but the cough continued, and was accompanied with pain in the breast; and on the gradual increase of these symptoms, she at the end of six weeks entered the hospital.

At this time the symptoms were, great difficulty of breathing, cough almost incessant, pain in the breast, with great anxiety, and frequent hard pulse. After repeated blood-letting the pain was abated, but not the cough, which continued with the same severity. The blood was very much buffed; but the patient was so feeble that M. S. dared not venture on another blood-letting, especially as he was aware that he could not remove the cause of the disorder. The cheeks, though marked with red spots, were not tinged with the uniform circumscribed redness which is observed in florid consumption. The breathing was so difficult that the patient was unable to lay down, and was obliged to keep the person inclined forward. He did not venture to give an emetic, for fear lest the inflammation should be aggravated. At length, after the greatest agony, death took place.

Upon inspecting the body all the intestines were found reddened and inflamed, though no complaint of pain of the belly had been made.

The windpipe was filled with a black gory fluid. The lungs were indurated. The bronchial glands were enlarged, black, and in various parts suppurated. The right lung was occupied by several tubercles, among which was a vomica in the middle lobe, filled not with purulent matter but with black gore.

The left lung contained every where tubercles and several small *vomicæ*, such as are commonly met with in catarrhal consumption; but in the left branch of the *bronchus*, about an inch from the bifurcation of the windpipe, was found a bone covered with black viscid mucus. This bone was rough, and its angles had so completely penetrated the bronchial mucous membrane, that it could be moved neither upwards nor downwards.

This bone, with the trachea, M. Schroeder preserves in spirits.

From this case, M. Schroeder infers that inflammation had spread from the bronchial tubes through the lungs, and in these organs had produced tubercles and *vomicæ*. As the irritation was so violent, the inflammation so speedily completed its stages that it could scarcely be denominated catarrhal consumption (*phthisis pituitosa,*) which generally observes a more chronic course. He adduces it, however, as an example to prove, that inflammation of the bronchial tubes may produce tubercles in the lungs, such as are found in catarrhal consumption; for since the patient had always previously been healthy, there was no doubt that the tubercles and *vomicæ* had arisen after the bone had slipt into the bronchial tubes.

He regards the black viscid gore in the windpipe and bronchial tubes, though singular, as likely to have proceeded from the bronchial glands. The *sputa*, which were muco-purulent, had been sometimes black during life.

It may be observed, that in this conclusion there is at least one source of fallacy in the circumstance, that the individual may have had pulmonary tubercles at the time at which the bone was carried into the windpipe, although there were no symptoms indicating the presence of these bodies. We know, from various cases recorded by different individuals, but especially from those recorded in this Journal, Vol. xliii., by Dr James C. Gregory, Dr Alison, and myself, that tubercles may either exist in the lungs without giving rise to urgent or manifest symptoms, or that they must be generated in an incredibly short space of time in consequence of mere inflammation. Though M. Schroeder deduces from the facts of the case now detailed, the conclusion, that the tubercular deposition and destruction was the immediate effect of inflammation, yet it is possible, and not altogether improbable, that tubercles may have pre-existed, and that they were merely called into an active state by the inflammation excited by the presence of a foreign body.

On Scarlet Fever as it has been prevalent in Edinburgh. By Dr Craigie.—Scarlet fever has been remarkably prevalent in this city and its suburbs, from the month of October and November 1835 to the present time, when a few cases continue from time to time to take place. During this period it has prevailed among all ranks with great severity, and attacked not only young persons but adults, in perhaps a greater proportion than in any epidemic for a long time past. These circumstances, with some others which we believe to be, though not peculiar, yet very remarkable, led us to expect before this time some notice of the disease; and we trust that we shall yet receive from those gentleman most engaged in the treatment of the cases some valuable information. In the mean time, perhaps, a short notice of a few of its peculiarities, may not be unseasonable.

Last autumn affections of the mucous membrane of the throat were not uncommon. They by no means resembled the usual inflammation of the tonsils, which is seated most in the cellular tissue, but seemed to affect a large extent of the mucous membrane covering the soft palate, the tonsils, and rest of the throat, and gave rise to a peculiar cutting feeling of rawness and soreness, as if the membrane had been scraped off, and causing much difficulty in deglutition. The pulse varied from 96 to 104 and 108. In the cases of this affection which I had occasion to see, the best and most effectual remedy I found to be a strong solution of nitrate of silver, (ten grains to the ounce) applied by means of a camel-hair pencil all over the guttural mucous membrane. One application of this always relieved the urgent uneasiness, and after the second and third application, the complaint in general disappeared entirely. Cathartics and diaphoretics, especially the *Aqua Acetatis Ammoniae*, were also at the same time used where requisite. But it is remarkable that after the uneasiness in the throat was removed by the application of the lunar solution; the pulse fell to the natural standard. In one remarkable case in which the patient, a young person of 19, was no better after the use of the ordinary remedies for two days, and had spent a bad night, the application of the solution on the morning of the third was followed by a reduction of the pulse in a few hours from 96 to 90, and on the evening of the same day to 82.

This affection, which I think is of the nature of the diphtheral or mucous inflammations, appeared to be the precursor of the more serious and formidable epidemic which subsequently took place.

In the month of October a few insulated cases took place; and in November and December they continued from time to time to occur, till during the latter two weeks of the latter month they were very general, and several were fatal. The disease continued to increase in extent in January and February, and in the beginning of March several severe and some fatal cases took place. In the course of the same month it appeared in Heriot's Hospital, and prevailed to a greater or less extent among the children in that institution, till the end of April or the beginning of May. From Mr William Wood a good account of these cases may, we trust, be expected.

The disease has continued, though less extensively diffused, to the present time, a few insulated cases taking place occasionally. Latterly it has affected adults more than children, probably from the circumstance that all the susceptible young persons have passed through the disease during the winter and spring.

The general characters of this epidemic have been nearly the following. The disease appeared in one class of cases in the form of throat affection, with little or no eruption on the skin. In another class, the eruption on the skin was intensely red, with redness of the eyes and face, and occasionally swelling, In a third class the disease was divided between the mucous surface of the throat and the surface of the skin.

In several cases there was at the angle of the jaw much external swelling, with tenderness and pain of the surface not admitting of pressure.

In most of the cases which I saw myself the pulse was seldom under 140, tense and full. In one or two cases it ranged from 150 to 160. The respiration was also rapid, being from 32 to 40.

One of the most remarkable features of the disease was a painful diffuse swelling affecting the smaller joints at the close of the complaint, when the eruption was beginning to fade. It began in the wrists and ankles, and passed downwards to the fingers and toes. In one young lady of 15, who had an attack of the disease otherwise mild, the pain in the wrists on the fifth day was so intense, that she could not allow them to be touched or examined in the gentlest manner or moved. Next day the wrists were less painful, and the fingers were affected with slight diffuse swelling, some redness, and most intense pain. The ensuing day, under the use of medicines, these sensations were almost gone. The ankles and feet were at the same time affected much in the same manner.

In another young lady of 8, who had a much more severe attack, and who was blooded from the arm three times in the course of the disease, this painful affection of the fingers and toes appeared on the seventh day of the disease. The skin of the hands was tense, glistening, slightly red, and so painful that motion of the hands and fingers was impracticable. At the same time, the skin of the dorsal surface of each foot was similarly affected. Next day the pain was somewhat abated, but the swelling continued; while the skin of the fingers and toes were tense, red, and painful. On the following day these symptoms were on the decline; and on the fourth day from their appearance the hands and feet were natural.

Upon mentioning these complaints to some of my professional friends, as Mr William Wood and Dr John Smith, I find that they had met with similar painful affections of the hands and feet towards the close of the eruption in several scarlet fever cases. I shall afterwards advert to the occurrence of this symptom in former epidemics, as mentioned by authors.

The disease almost in every case left great feebleness of the circulation of the skin and mucous surfaces. The former remained long dry and imperspirable after all the symptoms of fever had subsided; and the circulation and secretions both of the gastro-pulmonary and genito-urinary mucous membrane continued long in a deranged state. Though the appetite was often good after convalescence was established, sickness and vomiting were occasionally induced; sometimes cough with sonorous ronchus and sibilous wheeze continued; and in several cases the urine became albuminous after the febrile symptoms had entirely disappeared. These peculiarities will be perhaps best illustrated by the notice of some of the cases.

1. Miss J—— G—— aged 4, had been sent from her own home, where the disease had been fatal to a younger brother, in order to be protected from the contagion, to the house of a friend in a distant part of the town. On the 10th of February, when I was visiting another member of the same family for a different complaint, I happened, from observing the respiration to be rather quick, to examine the chest, and found indications of *bronchitis* all over both lungs, but most intense in the left. The pulse was at the same time 120, and the respiration was 40 in the minute. I recommended instantly the lady of the house to inform the parent of this child that she was unwell, and to have her sent home immediately. The mother, however, refused, and requested, that, whatever the complaint of the child might be, she should be kept where she was, and treated accordingly. Next day, 11th February, the eruption was distinct over the face, neck, and trunk, with sore throat. The respiration was 32, the mucous and crepitous râttle much less intense, though still perceptible on the left side. The pulse was 140, tense and sharp, and the skin burning hot. The bowels were freely opened with calomel and jalap. In the evening of the same day the eruption was general over the belly, and thighs, and legs, and though the throat was red and diffusely swelled, the patient complained little. The respiration was from 28 to 30; and the pulse 132.

Next day, the 12th, after rather a bad night, the throat was more uneasy, impeding deglutition, and it emitted a most heavy fetid odour, most nearly resembling that of putrid fish. Respiration was 30, with sonorous rhonchus in the left lung, and some parts of the right. The pulse was 124. The eruption continued vivid on the face and person, and was affecting the fore-arm, and ancles, and feet. The throat was touched with the lunar solution, which brought up much viscid phlegm. Some castor oil was given in the morning, and four grains of calomel with eight of jalap were ordered.

On the 13th, the symptoms were rather aggravated, in want of sleep, intense heat of skin, rapid with labouring respiration, and more sonorous rhonchus, with some mucous rattle on the left side, and the pulse at 140. The bowels had been moved by the calomel and jalap, and castor oil had been given in the morning. Solution of tartrate of antimony was ordered.

On the 14th, as the symptoms were the same, a vein was opened at the arm, and three ounces of blood were drawn, after which the face became less red, and the patient fell asleep and had a better night. The bowels were freely moved.

On the 15th, the eruption was still vivid; the respiration was at 32, with crepitous and mucous rattle on the left side; the pulse was 140, the skin dry, the tongue was much furred, and the throat still complained of. A blister was applied to the left side, and kept on for four hours, when it had vesicated the skin freely. The bowels had been very completely moved. Some compound jalap powder was ordered.

Next day, 16th, after a quiet night with sleep, the skin was less hot, the eruption was fading, and the throat was less uneasy. The respiration was 30, with crepitous rattle on the left side, and sonorous on the right, much less intense. The pulse was 120–128; the tongue was pretty clean, there was some return of appetite, and she had taken some food. All the medicines except the antimonial solution were stopped.

On the 17th the pulse was at 90, and the respiration was 24. The eruption was fading rapidly.

After this time the patient recovered slowly but steadily. The skin kept long dry, and the pulse continued about 86 to 90, with occasional returns of unnatural respiration. But by the use of cathartic medicine, and the antimonial mixture, as circumstances required, all the symptoms were subdued by the middle of March.

2. On the 25th February, Miss M. aged 8, had painful swelling of the left angle of the jaw, some flushing of the face, pulse at 130, heat of skin, but was otherwise in good spirits. The throat, however, was red and sore, and the eruption was beginning on the face, neck, and wrists; and an emetic was exhibited. In the evening the pulse was 160, and respiration was short and rapid. Five grains of calomel and six of antimonial powder were ordered.

Next morning (26th) at six I was sent for. The night had been bad, with great restlessness, difficulty of deglutition, and a sense of impending suffocation. The external swelling was much increased, with great tenderness of the surface and pain. The throat could not be satisfactorily inspected from the pain of the swelling; but both tonsils were felt much enlarged; and the breath emitted the fetid odour of putrid fish. The bowels had been scantily moved. I took four ounces of blood from the arm, when paleness and a little faintness came on. The eruption continued to appear; and on the fore-arms and wrists it was distinctly papulated. Some calomel and jalap was ordered.

In the course of the day the pain of the external swelling and tenderness of the surface became much less, admitting pressure and motion, and the eruption continued to spread and become more vivid.

Next morning, however, (27th) I was summoned at two A. M. for great restlessness with delirium. The pulse was 140, full and tense, the skin hot, the throat very sore, with much external swelling, and some return of pain. Swelling now appearing on the right side, I took four ounces of blood from the arm. After this she fell asleep, and continued so till nine A. M. when I again saw her. The throat was, after great resistance, touched with solid caustic, as it was impossible to get the pencil efficiently into the throat. Calomel and jalap was again ordered.

On the 28th, she had spent a better night; and the swelling at the left angle of the jaw, though not gone, was much diminished, and was quite free from tenderness or pain. The throat was less sore, and deglutition was more practicable. The swelling of the right angle of the jaw was also less painful, but was unchanged as to size. The eruption also came out completely over the body and legs, and was rather less vivid on the face. The bowels had been moved, but not very freely. The compound jalap powder was given, as the saline infusion of senna was rejected. Next night was spent much as before. The bowels had been moved. The eruption was fading from the neck and face; but was still vivid, with distinct papulation on the arms and legs. The swelling at left angle of the jaw was gone. That on the right side was declining. The pulse kept at 156 to 160.

On the 1st of March, she was much the same. At evening, there was some aggravation of the symptoms, in headach and increased soreness of the throat on the right side. The left tonsil, which was now seen, was almost natural in size, and its surface was acquiring the natural red colour. The urine all this time was scanty and high-coloured. One ounce and a-half of blood was drawn from the arm.

Next day (2d March) after a better night, the tongue was clean, the throat free from soreness or external swelling, the eruption was gone, and the pulse was at 120. The hands and fingers, however, were diffusely swelled, reddish, glistening, and extremely sore and tender. The compound colocynth pill was ordered. In the evening, the pulse was 124, the other symptoms the same. The bowels were scantily moved. Two pills were ordered at bed-time.

Next day (3d) after a pretty good night, the throat was well; but the pulse was still about 130 to 132, and in the evening it rose to 140, with very hot skin, and severe pains of the fingers, and now also of the toes, with diffuse swelling. She had drank two much milk, which had been allowed almost as freely as she chose. A dose of calomel and jalap was given; and at bed-time the colocynth pills. The hands and feet were fomented with hot water.

Next day, after some sleep, and intervals, and free motion of the bowels, the tongue was clean, the pulse had fallen to 120, and the swelling and pain of the fingers was abated. Those of the metatarsal region of the feet and of the toes continued little changed. The pills were repeated.

On the morning of the 5th she had not slept well; but the bowels had been freely moved. The tongue was clean, the swelling of the throat entirely gone, and the pulse 112. The skin was still dry, except at the flexures of the joints. The fingers were much easier, and though the toes were swelled and tense, no complaint was made. The same evening at eight P. M. the pulse was 110, the first time the pulse was decidedly down in the evening. The rheumatic pains were not felt.

Next day there was no complaint, and the pulse was 104. The urine was not scanty, but not abundant.

The next night was bad, with headach, sickness, restlessness, and vomiting. The pulse was 110. She had secretly indulged in marmalade, and no pill had been given. The pills were given in the morning, and produced a small and partial alvine discharge. The compound calomel powder was given, which operated actively; and in the evening all sickness and headach were gone, and the pulse was again down to 104. A good night followed; and after free motion of the bowels, the pulse was at 96.

From this time recovery proceeded slowly; though the frequent use of rhubarb and magnesia, the compound jalap powder, and calomel and jalap with very restrained diet, was requisite. The urine became natural in quantity and appearance; and no unfavourable result ensued.

In this instance the eruption did not present the usual characters of scarlet fever in the arms and legs. But the skin of both presented diffuse erythematous redness surmounted by distinct closely set *papulae*. The blood-letting, which was performed three times, was urgently indicated each time, not only by the intensity of the general fever, but by the state of the throat, and a slight appearance of blood in the urine on the 2d day of the disease. Instead of having the effect, as has been occasionally represented, of repressing the eruption, that appeared to come out after each blood-letting with increased energy and greater facility. The recovery in this case was progressive and complete. No bad symptom ensued unless from error in diet; and it required only strict adherence to the use of vegetable food for two weeks after to preserve the system right.

The effect of errors in this respect will be seen presently.

3. 4. Miss J. and G. sisters, were attacked, the former on the 19th of March, the latter on the 20th. In the first, aged 11, the eruption was completely out on the 20th on the evening, and there was little affection of the throat. The case proceeded through its several stages without any unusual or unfavourable symptom, faded from the face and neck on the evening of the 26th, and had run its course by the 28th, leaving a dry but freely des-

quamating state of the skin. The pulse was from 140 to 150; but fell now to 70, to 64, and 68. The only remedies used were cathartics, the tepid bath, and diluents. The patient was convalescent on the 1st of April, but was not allowed to rise till the 3d.

The case of the second, aged 13, was more severe. There was considerable soreness of the throat internally, with difficulty of deglutition, the characteristic fetid smell of the breath and throat, and considerable painful swelling at the left angle of the jaw, with much headach. For these symptoms she was blooded from the arm to the extent of five ounces, and two days after to the extent of three more. The pain and swelling of the throat abated, the eruption came out freely and run its course regularly, declining on the 29th; and on the 31st the pulse, which had varied from 140 to 154, came down to 90, and next day to 72. Convalescence went on steadily; the appetite was good, and the strength gradually returned. On the 5th, both were left as not requiring constant medical attendance; but with strict injunctions to be sheltered from exposure to cold, and to be confined to farinaceous food, with a moderate allowance of milk.

On the 11th of April, both had eaten pretty freely of fried fish, and one had been exposed at the window to the east wind. The same evening sickness and vomiting came on, succeeded by headach and great heat; and next day when I saw them, both had the pulse at about 120, the tongue foul, the skin hot, and the urine scanty. An emetic of 20 grains of ipecacuan was ordered to each; and, two hours after the operation, five grains of calomel with 10 of jalap. In the course of a few days, under the use of cathartics, the tongue became clean, the pulse natural, and the skin cool but still dry; and on the 17th April both were so well that they were entreating to be allowed to get up. On the 18th the younger had another attack of fever with disorder of the stomach; and it turned out upon examination that she had been up and walked through the house unclothed, and then gotten some beaf-steak and port wine. This was also rejected. The urine afforded at the same time, upon being heated a copious coagulated mass and continued coagulable to the last. In two days, cough, expectoration, and other symptoms of bronchitis, though mild, were established. The usual remedies were employed, and she seemed to recover, till the 23d, when I was sent for in the morning, and found her with rapid panting breathing, livescent lips, blueness of the hands and feet, with some slight swelling, and much distension of the veins of the extremities. The mucous rattle was strongly heard all over both sides of the chest, and there was frequent short cough and violent action of the heart with small pulse at 130. The chest sounded dull at the lower region, and especially in the right side.

Five ounces of blood were instantly drawn from the arm, a blister was applied to the breast, and an antimonial mixture was ordered, while the bowels were opened by calomel and jalap. In the afternoon some relief having been obtained by the blood-letting of the morning, though the breathing was still oppressed and rapid, two ounces more were drawn. The night was spent badly, and the symptoms were little abated. Calomel and opium in minute doses were given; and afterwards small quantities of claret were allowed to support the strength. Death took place on the morning of the 25th April. The urine was albuminous to the last.

No inspection could be obtained.

In the elder sister a similar irregularity was followed by swelling at the left angle of the jaw, with most acute pain and general fever, and afterwards with symptoms of *bronchitis* and pleurisy of the left side; and the urine afforded when heated a large quantity of coagulable matter, and contained blood even when inspected. The swelling at the throat, and the bronchial and pleuritic symptoms were opposed by the application of leeches to the throat and to the side, and a large blister to the left side, with the use of antimonials, cathartics, and the *Aqua Acetatis Ammoniae*. When the pleuritic symptoms subsided, the swelling at the throat recurred on the 26th April, with acute pain in the ear, and the pulse at 120, and required a second application of leeches, and the use of the antimonial solution. The blood drawn by five leeches removed the pain and swelling, and brought the pulse down in the course of twenty-four hours to 80, and on the 28th to 72. The urine, however, presented blood, and continued highly albuminous; and for this cathartics with powders of carbonate of soda, supertartrate of potass, and nitrate of potass were given.

Under the use of these means, the symptoms improved so much, that, on the 1st and 2d of May, the urine contained little or no albumen. On the 3d, however, it reappeared, and the face was swelled on the 4th, and on the 5th, 6th, and 7th, in addition to these symptoms, the pulse was up at 96 and 100. As this was occasioned by errors in diet, repeated large doses of compound jalap powder, with occasional doses of calomel and jalap, and castor oil, and saline infusion of senna were given before the pulse became natural.

On the 14th of May, there was another accession of fever, with the pulse at 105, and both the face and feet were swelled. The solution of tartrate of antimony was ordered to nauseate or produce vomiting, which took place in the evening; after which calomel and jalap was ordered. Next day the pulse fell to 88, and the day after, 16th, to 80; the tongue was clean, the bowels had been frequently moved, the face was pale, and leucophlegmatic, but the feet were free from swelling. The urine was still highly albuminous, and contained blood; and fluid was in the belly. After this the pulse fell to 72, and was seldom above 80; and on the 18th and 19th May, the urine was boiled without showing albumen, and presented no appearance of blood, having acquired its natural colour. This, however, was only temporary; for on the 21st and 22d, it again showed coagulable matter. Convalescence, however, proceeded, and the patient was sufficiently well to be removed to a country situation on the 25th of May; and since then she has continued quite well, and is recovering flesh and strength. I have not, however, had an opportunity of ascertaining the state of the urine.

I may mention, that in both cases the urine was of low density, about 1010 to 1012; but, as I found that the hydrometer which I used was not altogether correct, I was obliged to reject the observations made by means of it.

In the latter case it is remarkable that the patient was previously not in good health. She had during the whole winter laboured under cough, which became particularly violent, whenever the feet were wetted, or the stomach and bowels were disordered. The belly was also very tumid, and required the repeated use of purgative medicines.

In another case in which the disease attacked a gentleman of 22, who had, two years ago, laboured under disease of the left lung, which had left hepatization of its lower lobe, the cough became much aggravated, with puriform expectoration, which came on and continued till the middle of February, the pulse became quick, with nocturnal sweats, and the patient had all the symptoms of incipient consumption. These symptoms appeared to be the result of a premature return to animal diet, and going out too soon. I recommended the patient to confine himself entirely to food, consisting of farinaceous matter, for three or four weeks, and to remain within doors during bad weather, and to have a blister applied over the lower part of the left chest. Under this management, with the use of a little occasional cathartic medicine, and solution of tartrate of antimony, he became quite well in April, and was enabled to undertake a long journey in May.

I believe it cannot be doubted that, though the recent epidemic presented several peculiarities, yet others have taken place with more or fewer of the same or very similar symptoms. I find at least two epidemics with very several similar symptoms recorded by medical authors.

The first to which I refer is mentioned by Sennert, who describes a variety of scarlet fever in which he states there were not only inflammation of the throat and other viscera, but at the close of the disease, the matter was often transferred to the joints, and excited pain and redness exactly as in gout; and in other instances it caused the feet to swell, affected the respiration, and induced swelling of the belly.* The latter termination has been noticed by Morton, Plencis, and almost every one who has observed the disease.

The papulated appearance of the eruption has been also observed, both by the Berlin physicians and by J. G. Zimmerman of Moscow, who published at Heidelberg in 1779, a very good account of scarlet fever, as it appeared at Manheim in 1775 and 1776. According to the former authorities these papulae appeared on the 3d or 4th day, and preceded the redness uniformly. According to the account of Dr Zimmerman these *papulae* appeared on the fourth day. (Quarto undeque papulae minimae rubecundæ confertae, in areolas dispersae apparent, et aliqua symptomatum alleviatio est.) The alleviation I did not observe.

Similar papulae appear to have been seen by Sydenham and Bruning.†

SURGERY.

Extraction of a Brass Pin from the Bladder of a Woman by a New Instrument. By VINCENT BIANCHETTI. (Annali Universali di Medecina, Vol. lxxxv. p. 150.)—Maria Ghizzi, aged 16, of irritable temperament, was long tormented by intense itching along the canal of the *urethra*, which she relieved by introducing into the canal a little fork of thick brass wire, and which she used, according to the custom of the country, to pin her hair. This instrument escaping, slipped into the *urethra;* and the attempts which she made to extract it by means of a large needle with a buttoned end thrust it completely into the bladder.

Dr Bianchetti procured a *cannula* of polished steel, four inches long and three lines in diameter, with one extremity prolonged in the shape of a handle, and an iron rod, the upper extremity of which ended in a transverse bar for holding it, and the lower, in a pincer, the toothed blades of which were separated by a spring, while the rod was furnished with a vice moveable by a screw.

The patient being placed on the edge of the bed, with the thighs bent on the belly and parted from each other, after dilating slightly the canal of the *urethra*, he introduced the *cannula*, and injected some warm water into the bladder. He then introduced through the *cannula* the metal rod already mentioned, and moved it in several directions within the bladder with the hope of meeting the foreign body. As soon as he felt that the little pin had fallen between the blades of the pincer, he introduced to a greater depth the *cannula*, the circular margin of which pressed the blades together and closed them. The operator then arranged the instrument in such a direction that the foreign body occupied nearly the central portion of the cavity of the bladder,—with the intention of protecting the walls of the organ from injury. Then passing along the vice of the metal rod, the screw which there rested against the upper end of the *cannula*, he, without any shock or uneasiness, drew the foreign body, which was held by the blades of the pincers, into the interior of the *cannula*, and thus extracted it without inconvenience. The patient returned immediately to her occupations.

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* Sennertus de Febribus, lib. iv. chap. xii.

† G. T. Bruning, Constitutio Epidemica Essedensis.

MIDWIFERY.

Vagitus Uterinus, or Crying of the Fœtus within the Womb. By Dr **Robert Collins**, late Master of the Dubling Lying-in-hospital. (Practical Treatise on Midwifery, by Robert Collins, London, 1835.)—The extraordinary circumstance of a child crying, and therefore breathing within the womb, and previous to delivery, though maintained as a possible occurrence by several foreign physicians, has been very generally not only denied, but ridiculed, as physiologically impossible by most English and French physicians. One of the best authenticated cases in the human subject, was transmitted to us by Dr William Lister, from Dr Zitterland of Strasburg in 1822, and was published in the eighteenth volume of this Journal, (p. 551.) In that case, in the instance of a lady pregnant for the eighth time, and about four or five weeks from the period of gestation, forty-eight hours previous to delivery, the cries of a child were distinctly heard on the evening of the 25th July 1821, not by one person only, but by several; and delivery took place at six in the evening of the 27th July of a child which seemed about eight months old, and though it uttered a few weak tones, died about half an hour after birth.

An instance of the *vagitus uterinus* in one of the lower animals was also published in 1828, by M. Lesauvage of Caen, who heard in the case of a pregnant bitch the distinct cries of the puppies, also forty-eight hours previous to expulsion from the *uterus;* and who therefore admits its possibility in the human subject.

One of the best authenticated and most satisfactory instances of this phenomenon in the human subject, however, is given by Dr Robert Collins, in the following case of laceration of the womb, recorded in his recently published valuable work on midwifery.

" No. 21.—Was 36 hours in labour with her second child (her first born alive.) The pains were at no time severe, nor did the head descend so low into the pelvis as to cause the face to turn into the hollow of the sacrum. Her pulse was quick; she seemed anxious and restless; her strength began to fail, so much so, that her pulse faltered; her countenance became ghastly; extremities cold and livid, with vomiting. One hour previously she had no alarming symptom.

" She was immediately delivered with the crotchet. The hand was then passed to ascertain the extent of the laceration, (as there could hardly be a doubt of its having occurred :) but none could be satisfactorily detected. She never rallied. She died in 17 hours.

" On dissection, a laceration was found in extent about two inches, anteriorly and to the left side, running from the junction of the uterus and vagina, upwards in a longitudinal direction, and confined to the muscular substance of the uterus, the peritoneum remaining uninjured. There was a considerable effusion of blood between this and the muscular substance, near the lacerated part. There was also a quantity of bloody fluid in the cavity of the abdomen. The intestines were exceedingly vascular.

" The most extraordinary occurrence in this case was the *respiration* and *crying* of the *child in utero;* both of which were heard, as distinctly as possible, four hours before delivery, the latter at a distance of some yards from the couch on which the patient was lying. These facts were witnessed by myself and assistants, besides several of the pupils, both by stethoscopic examination and otherwise. The head was, at this time, high in the pelvis; the soft parts partially dilated, and the waters but a short time discharged.

" The cry was so distinct, that I imagined the child was placed merely under the bed-clothes. When called to witness this truly singular phenomenon, I little credited the truth of what I was told, and confess, had I not been present, I should have remained sceptical.

" How forcibly should this fact prove the uncertainty of some of the tests most confided in, as indicative of the murder of new-born infants! It also affords the medical witness in such cases, a salutary caution, in addition to those so ably advanced by the learned Doctor William Hunter on this subject."—Pp. 298-299.

MEDICAL POLICE.

Mortality caused among Foundlings, and ascribed to Foundling Hospitals. By Signor MACERONI, Physician at Rome. (Sittings of the Royal Academy of Medicine, 5th April.)—From a memoir by this gentleman, read at the meeting of the Royal Academy, it appears, that, in 1831, the mortality of infants deposited in the Orphan Hospital at Rome had always been about 70 per cent. in the month. This destruction of the race Signor Maceroni at first ascribed to a general system in nature, which, according to him, does not allow the great part of the beings created to reach the years of maturity. Afterwards, however, he ascribed it chiefly to the bad arrangement, and especially to the faulty administration of the establishment in which the infants were received. In a narrow ward, 85 Roman palms long, and 35 broad, were placed 68 infants and 19 nurses. As there were only twenty odd cribs for containing the whole, six were collected in each; and the healthy infants lay beside the sickly. The filth was extreme, and the confusion was dreadfully augmented by the piercing cries of the children, and the want of all cares. Signor Maceroni eagerly announced the urgency of enlarging the hospital, and greater strictness in the selection of nurses. He insisted upon separating the healthy children, and isolating the sickly children attacked with contagious diseases. He, in short, proposed to rear without the walls of the establishment a great proportion of the infants, and especially to place over the establishment a permanent physician and a responsible inspectress. Signor Maceroni properly rejects from the wards of new-born infants and nurses, fumigations of nitric acid and chlorine, and prefers the renewal of atmospheric air more less frequently repeated. He also, with great justice, severely prohibits narcotics for quieting the cries of children.

In concluding with the important question as to the utility of Foundling Hospitals, he remarks, that, from 1640 to 1745, a frightful mortality prevailed at the Foundling Hospital at Paris. At Perpignan, among 100 infants received into the establishment, scarcely 12 or 15 attained the age of 5 years. Lastly, in the capital of Germany, in the course of forty years, a single infant at the Orphan Hospital might attain the age of manhood; and, according to the calculation of Girtanner, this man cost the state 20,000 dollars annually.

Discovery of Cow-Pox at Passy, (Royal Academy of Medicine, meeting of 12th April. Archives Generales, April, Tome x.)—M. Bousquet stated, that in a cow brought from Mantes, a woman named Fleury, to whom the animal belonged, observed in milking that one of the teats presented a large pustule. She soon discovered similar pustules on her hand at the points at which they were chafed; and a pustule appeared on her person. Alarmed for the malignant or carbuncular pustule, the owner of the cow consulted at Chaillot Dr Perdreau, who recognizing the eruption for cow-pox, sent her to M. Nauche, who referred her to M. Bousquet. M. Bousquet immediately inoculated several children with the fluid of the pustules of this woman. In some the matter alone was employed for inoculation; and in others the old vaccine virus was comparatively and simultaneously used. This experiment the Vaccination Commission prosecuted. The pustule in the cow was at the stage of dessiccation. The woman Fleury was to have collected the crusts carefully; but this she neglected to do, and this first source of the virus was lost.

M. Rochoux solicited particularly attention to the most important question here, and on the solution of which depends the entire importance to be finally ascribed to these researches. Is the vaccine lymph of Jenner enfeebled by its numerous transmissions? Is it indispensably necessary to renew that lymph which has been thirty years in employment? Allowing that it is collected only on the ninth day after inoculation, that produces at a mean rate from 1200 to 1400 transmissions, which it has undergone to the present time. It has then undergone no change nor loss of power. From a reflection of M. Capuron, M. Bousquet states, that the cicatrix left by cow-pox on the teat of the cow was imperfectly marked, and that nothing could yet be anticipated in this respect in the children vaccinated, as the vaccination had not in them run its several stages. M. Moreau, though he regretted that the crusts had been lost, thought the circumstance unimportant, and believed that the most essential point was to examine with precision, whether the pustules produced by the new vaccination were identical with the old one or different from it. Since the event of the publication of the re-discovery of cow-pox, M. Moreau has received from all quarters, letters requesting from him new vaccine lymph, the old being rejected as inferior. It belongs to the Academy to rectify whatever prejudice this opinion may threaten to the security of the public.

The experimental observation suggested by M. Moreau was not neglected by M. Bousquet. In two children inoculated by two vaccine pustules at once, he ascertained that the pustules produced by the new vaccine lymph alone presented no difference from the old one.

M. Moreau maintained that the size of the pustules was of no moment, since this developement is obtained by virus collected earlier than is usually done. M. Moreau is in the habit of not waiting till the eighth or ninth day, to take the vaccine lymph for insertion. The fluid collected on the sixth day is more energetic, and produces larger pustules (vesicles.) The same fact was observed when the cow-pox sent from England by M. Talleyrand to M. Bourdouis de la Motte was tried. In the first experiment, the pustules (vesicles,) which succeeded inoculation appeared very large; in the second they were of the ordinary size. He conjectures that these accidents in vaccination may be under the influence of atmospherical constitution, idiosyncrasy, &c. These latter explanations, however, M. Bousquet rejects. The circumstances were in the two cases specified absolutely the same.

M. Emery admits by no means that the old vaccine lymph has become enfeebled, trusting as much to the testimony of all the vaccinators as to his own experience. In his practice at St Louis, there have been admitted from 1000 to 1200 variolous patients amidst vaccinated individuals, whose number might amount to 12,000 or 14,000; yet among the latter M. Emery has not ascertained a single case of contagion. Another argument furnished by M. Emery is, that if the old vaccine lymph were altered, it is chiefly in the recently vaccinated subjects that the variolous contagion ought to have most effect. The actual facts, however, are in complete opposition to this supposition. M. Emery further remarked that it was not yet proved that the new vaccine matter was prophylactic, much less that it had a marked superiority over the old. There was merely presumptive evidence in favour of equal action. And besides discoveries of cow-pox had been so often announced, and been followed with the hasty proclamation of experiments represented to be successful, but which subsequent trials had not confirmed, that it is absolutely necessary to be extremely cautious and guarded.

The discussion, of which we have here given an account, shews how imperfectly several of the most eminent French physicians are acquainted with the researches of our countrymen on the subject of the reproduction of the vaccine lymph from the cow. In the early stage of the history of vaccination, the lymph was repeatedly reproduced from the teats of the cow, and found to produce the characteristic effects. In January 1799, the disease was discovered among several cows in a dairy in Gray's Inn Lane in London; and from the vesicles produced by these animals Dr Woodville inoculated six persons; and though, from the circumstance of these vaccinations being performed in the small-pox hospital, the patients presented variolous eruptions, yet the modification which these eruptions exhibited indicated the influence of the vaccine disease. The disease was also discovered in 1800 among some cows in Oxfordshire, by Mr William Fermor of Tusmore in that county. Dr Struve of Gorlitz in Saxony mentions in the postscript of a letter dated 16th April 1802, that a woman aged 82 was then alive, who 72 years before had caught cow-pox by milking cows in Moravia. She had since that time been living in the same apartment with her brother when labouring under small-pox; and nursed her son when severely afflicted with the same disease, yet totally escaped infection.* From this statement it would result that a disease possessing the character of cow-pox was prevalent among the cows in Moravia in the year 1730.

At a much later period the disease was rediscovered in England. In the beginning of May 1825, Mr Tiley, veterinary surgeon at Dursley, was requested to see a cow that was very sickly at Mr William Long's of Clinger. Though Mr Tiley was at first perplexed by the extraordinary character of the case, he, however, upon examination, recognised the symptoms to depend upon a severe and aggravated form of cow-pox. He found on the teats several blackish scabs peculiar to the disease; and the whole skin, without exception, from the base of the horn to the tip of the tail, and the attachment of the hoofs, was one uniform surface not of vesicles or scabs, but of discharge similar to that produced by a blister. The skin of the nose also and to the edges of the lips was affected in the same manner. This disorder was accompanied with every symptom of violent fever, and the animal, having received no attention previous to the time at which she was seen by Mr Tiley, died. Ten other cows of the same herd, however, labouring at the same time under different stages of the same disease, he was requested to see and treat; and every day others were attacked until the whole herd, amounting to between forty and fifty cows, had the disease. The youngest of the cows, even from two years old to five, were affected with different degrees, and to various extent of the disease of the skin. Mr Tiley had previously regarded the disease as topical; but he now appears to have considered it as a general affection; and employed constitutional remedies; and every animal except the first one recovered.

It is in this history an important fact, that one of the servants of Mr Long being asked by a neighbour to milk a cow that was unmanageable, did so, but communicated the disease to the whole herd, which were affected in a similar manner. The whole of these also recovered. All the servants of Mr Long except one had sore fingers from milking these cows.†

It appears even that, previous to this time, Jenner himself was in the habit of reproducing the disease from the matter of the greasy heels of the horse. From this source he supplied Dr Baron and several of that gentleman's medical friends; and it was sent to Dr Thomson of Edinburgh, where it was employed in vaccinating patients at the New Town Dispensary, with, it is said, the characteristic physical characters and physiological effects.

For an account of the reproduction of the vaccine lymph in Indostan, we refer to the account of Mr Macpherson's experiments given in our forty-fourth volume, p. 493.

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* Dr Baron's Life of Jenner, p. 525.

† The life of Edward Jenner, M. D., &c. By John Baron, M. D. London, 1827, p. 351.

We would recommend to our friends in Paris the careful study of some of the earlier tracts on this subject, as those of Mr W. Fermor and Dr Loy, but, above all, Mr Moore's History of Vaccination, and the interesting Life of Dr Jenner, written by Dr Baron.

MISCELLANEOUS.

Military Surgery Class.—Certificate of merit, awarded by the votes of the class, after a comparative trial, and accompanied by a copy of the Professor's "Outlines of Military Surgery," with suitable inscription,—Louis Quier Bowerbank, from Jamaica.

A case of amputating instruments for the best dissertation on the Feigned and Factitious Diseases of Soldiers and Seamen,—Hector Gavin, Edinburgh.

A case of amputating instruments for the best dissertation on the following question—Are there any cases occurring in military practice, in which the operation of excision of the head of the femur may be substituted for amputation at the hip-joint?—Eaglesfield John Barker, from Dumfries-shire.

The following gentlemen were each presented by the Professor with a copy of his "Outlines of Military Surgery," as a mark of approbation of the merits of their respective essays:—Francis Cooke, from Cambridgeshire Lewis Quier Bowerbank, from Jamaica; Arthur C. MacNish, Edinburgh.

University of Edinburgh. Prizes to be given by the Medical Faculty.—I. The Medical Faculty resolve, That they will present annually three Gold Medals to the Medical Graduates of the University, for the best Thesis on three specified subjects.

II. That the first presentation shall take place on the Graduation-day of 1837.

III. That the following shall be the subjects of competition for that year;—

1. An Experimental Inquiry into the Physiology of Cutaneous Absorption, with its applications to Therapeutics.
2. An account of the cases, or of any class of cases, occurring in the Medical Clinical Wards attached to the University during any quarterly period between 1st November 1835 and 1st May 1837, with the exception of the Autumn of 1836.
3. An account of the cases, or of any class of cases, occurring in the Surgical Clinical Wards attached to the University, during any quarterly period between 1st November 1835 and 1st May 1837, with the exception of the Autumn of 1836.

IV. That the competing Theses shall be transmitted to the Dean of the Medical Faculty on or before 1st June 1837.

V. That each Thesis shall be accompanied with a sealed packet, inclosing the following declaration signed by the Author:

"I hereby declare on my honour, that in composing the annexed treatise, I have received no aid from any individual."

To which in the case of experiments he will add,—"and that the experiments described in it were performed with my own hands, and without any other assistance except what was indispensable for their performance."

The Thesis and sealed packet to be identified by a motto, and written in a fair and legible hand, and in such manner as that the author cannot be known, till the sealed packet be opened. The language to be English, Latin or French.

VI. That in the case of experiments the author of the Thesis pronounced to be the best may be called on to repeat and authenticate his results before a Committee of the Faculty.

VII. That the Faculty reserve to themselves the power of withholding any of the medals, if it shall appear to them that none of the Theses on one or more of the specified subjects is worthy of being so distinguished.

VIII. That the Competitors shall transmit to the Dean, at the same time with the other Candidates, the usual Thesis on any subject different from those specified for the Competition.

IX. That the Faculty will further bestow a fourth Gold Medal on the author of any Thesis on a subject chosen by himself, which may appear to them the best of the Thesis of that class, and worthy of receiving the honour.

X. That the successful Thesis shall in every case be published by their respective authors, with an appropriate title designating them as the Prize Dissertations for the year.

THOS. STEWART TRAILL,
Dean of the Medical Faculty.

University Edinburgh, Summer 1835 —The following Prizes were awarded in the Botanical Class at the end of Session 1834–35.

Gold Medal. For the best and approved Essay on the Anatomy and Functions of Leaves, to W. Francis Cooke from Cambridgeshire.

Silver Medal. For the second best and approved Essay on the same subject, to Mr John Buchanan, from Renfrewshire.

Gold Medal. For the best and approved Herbarium, collected within ten miles of Edinburgh during the preceding twelve months, to Mr George Atken, from Northumberland.

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Fig. 1.

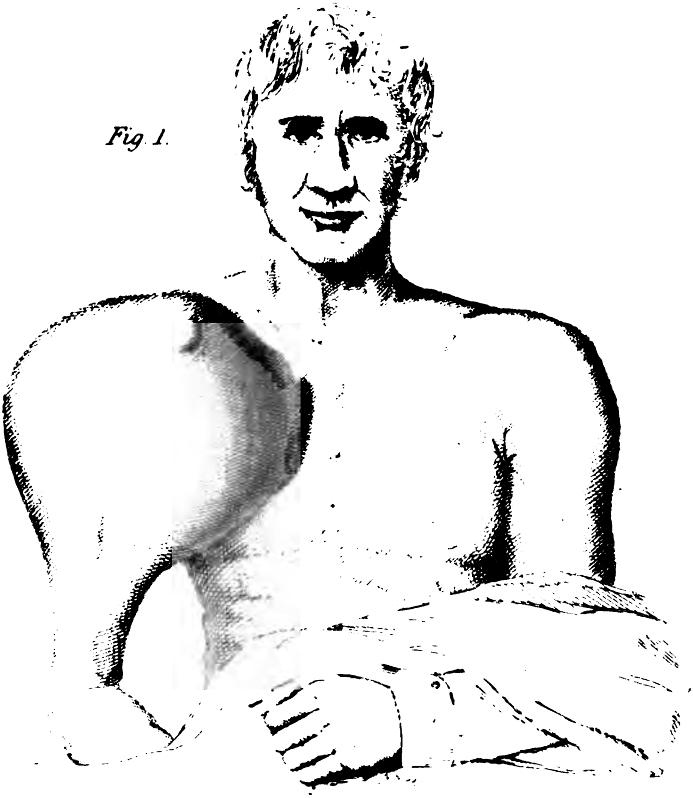
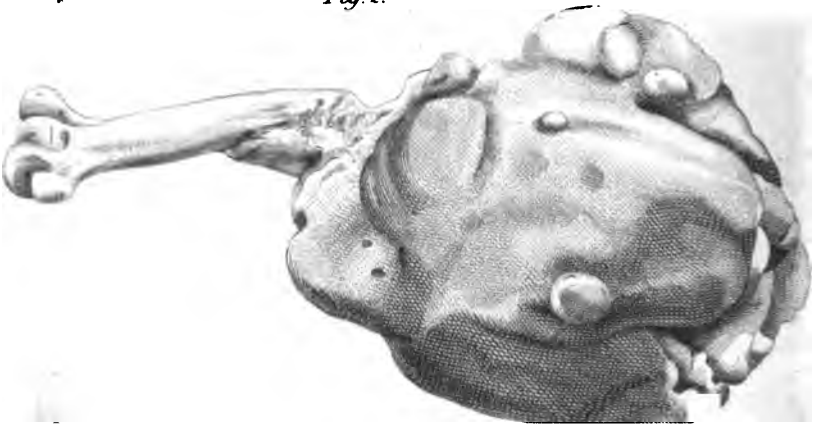


Fig. 2.



THE

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MEDICAL AND SURGICAL JOURNAL.

1. OCTOBER 1836.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Fourteenth Report of Surgical Cases.* By JAMES SYME, Esq. Professor of Clinical Surgery in the University of Edinburgh.

Fibro-cartilaginous Tumour of the Humerus—Removal together with the arm and part of the scapula and clavicle—Recovery.—David Dand, aged 45, from Dundee, was admitted on the 23d of December, on account of a large tumour of the right shoulder. Some idea of its form and size may be obtained from the representation in Plate I. Fig. 1. It had a very broad base, which completely filled the axilla, and seemed to grow out from the side of the thorax. The shoulder-joint did not admit of any motion, but the arm moved freely along with the scapula. The head of the humerus seemed to be the centre of the swelling, which extended from it in every direction—terminating about half-way from the elbow—and approaching within two inches of the sternum. The clavicle and spine of the scapula could be traced nearly, but not quite to their junction. The consistence of the tumour was extremely firm, feeling in some parts as if it were composed of bone, and in others of fibro-cartilage. The surface appeared in general pretty equal, but when examined more carefully, was found to be irregularly nodulated. The colour of the integuments was not altered. The patient stated that, about six years ago, he began to feel pain occasionally in the shoulder, and six months afterwards, first observed on the fore part of the shoulder a swelling, which was firm, and appeared to be seated in the bone. The tumour gradually increased until August 1833, when he suffered a fracture of the affected humerus from falling on his side. The bone was broken about the middle, and united without any displacement. But the morbid growth advanced more rapidly after this injury—and his uneasy sensations kept pace with its progress. He said that what chiefly distressed him latterly was a feeling of weight and oppression, which never ceased—and was particularly severe during the night. He had no other complaint, and seemed to be sound in all other respects.

As the tumour had evidently originated from the humerus, there appeared good ground to believe that the other bones in its neighbourhood, though perhaps adhering or absorbed in consequence of its pressure, had not taken on the same diseased action—since the fibro-cartilaginous growth, which was evidently the nature of this tumour, is never known to spread its roots beyond the bone in which it originates. Several of the metacarpal and digital bones are not unfrequently expanded by such swellings; but in these cases they commence independently, and do not *spread* from one to the other. I therefore concluded that Dand's tumour required for its complete extirpation, nothing more than the removal of the humerus, and that, if it should be necessary to take away a part of any other bone, it would be merely to facilitate the separation of the adhesions, which had formed between the surface of the tumour, and the parts on which it rested. On this account the glenoid cavity of the scapula, the coracoid and acromion processes and the acromial extremity of the clavicle, might require to be taken away, but in doing so there did not seem to be much difficulty or risk of bad consequences to be anticipated. The removal of the tumour was accordingly recommended to the patient, and gladly acceded to by him, as he was not only suffering great distress, but had been rendered quite unable to support his family.

The operation was performed on the 5th of January. I commenced by making a semilunar incision on the inner side of the tumour, with its convexity forwards, beginning over the acromion process, and terminating at the lower margin of the axilla. The axillary artery was thus brought into view and tied. I then made a similar incision on the outer side of the tumour, joining the former one, and proceeded to divide the muscles, which were greatly expanded, and apparently much altered in their texture, being of a greyish-yellow colour, and of a consistence not unlike that of some malignant growths. These coverings having been divided, the tumour came distinctly into view. With the cutting-pliers, I easily cut through the acromion process and clavicle, and then depressing the arm separated its remaining attachments. It now appeared that a fibrous anchylosis had existed between the glenoid cavity and the tumour, which had a cup-like form, and embraced it on all sides. I therefore sawed through the neck of the scapula, and removed a portion of the bone, including the coracoid process, which could not have proved in any way useful, and might have delayed recovery. The edges of the wound came very well together. The patient never had any symptom of disturbance, and was dismissed quite well on the 13th of February.

The tumour weighed twelve pounds, and is represented in Plate I. Fig. 2. I macerated it in expectation of obtaining a specimen of foliated or acicular exostosis, similar to some others in my possession, but was disappointed, owing to the large proportion which the fibro-cartilaginous growth bore to the expanded bone, which consequently could not be preserved in one mass, and fell into pieces when deprived of the support it had received from the softer substance.

I heard lately of the patient, who continues well. The most disconcerting circumstance encountered in the operation was the alteration of the appearance and consistence of the muscles, which were well calculated to excite doubts as to the extent of the disease. The execution of it, though laborious and formidable, was not difficult, with the exception of the ligature of the axillary artery, which was very tense, owing to its being stretched over the tumour, and was not easily disengaged from the neighbouring parts.

I have at present under my care, a gentleman from Yorkshire, who came here to have a tumour of the scapula removed, and I found more difficulty in doing this apparently easy operation, which required merely that the part of the bone below the spine should be taken away, than in performing the seemingly more arduous one which has just been described. It is difficult, indeed, for any person who has not witnessed the excision of the scapula to conceive the embarrassment which proceeds from the quantity of muscular substance that requires division, and the number as well as size of the deep-seated blood-vessels.

Fractures.—At the Spring Perth Circuit, a case was tried in which some points relative to the production and consequences of fracture, were of great importance in determining the guilt of the accused. The observations I have next to mention tend to illustrate these points, but before proceeding to them, it may be well to relate the case in question. It was proved that a middle-aged man, of intemperate habits, and being at the time intoxicated, was, while he lay on the floor, struck twice on the left shin with a heavy poker—that after this he was lifted up and seated on a chair—that he then limped to the door, a distance of fifteen feet—that his leg was caught between the leaves of the door as he went out—that almost immediately afterwards he was found sitting on the smooth flag stones before the door, with the left tibia projecting three or four inches through a wound of the integuments—that he became delirious soon afterwards, and died at the end of a fortnight. On dissection, the tibia was found fractured, rather above the middle, with some small detached splinters, and the bone evidently dead to the extent of an inch, more or less in different parts, on both sides of the injury, being quite smooth and ivory looking, and surrounded by an effusion of new bone, between which and the dead portion an ulcerated groove was beginning to form. The medical men who attended the deceased, reported that the fracture of the tibia existed alone; but on making another examination after the body, at my suggestion, had been disinterred for the purpose, they found the head of the fibula comminuted into minute fragments, so as to retain hardly any trace of its form or appearance. Being examined on the trial, I gave the following evidence.

" James Syme, Professor of Clinical Surgery in the University of Edinburgh—*(the bones libelled on shown)*.—The fracture is a remarkable one, in so far as that of the *fibula* is through the head, or upper end of the bone. That of the *tibia* is such, as must have been caused by considerable violence. It could not have been caused by a simple fall of the body, without impulse. I should think, from the appearance of the *tibia*, that its fracture was occasioned by a blow. I think so, from the part of the bone where the fracture occurs,—the direction of the broken surface,—and the appearance of the bone in the neighbourhood, which appears to be *dead*. I have heard the evidence, and I believe that the violence inflicted by the poker might readily have occasioned the fracture of the *tibia*. After this, it is quite possible that Finlay might walk to the door,—supposing the *fibula* to remain entire; and though very *improbable*, it is not *impossible*—that he should walk though *both* bones were broken. I have known a person walk, after the thigh bone was broken,—but not without being lame. This is a much more extreme case, than that of a man walking after the *tibia* is broken, if the *fibula* remains entire. If a person of an ordinarily lame gait were to walk a few steps after the *tibia* was broken, it would depend much upon the accuracy of observation, whether any difference was perceived in his gait. The slamming of the door, as described in evidence, would account for the fracture of the *fibula* ;—or it might have been caused by a fall, when the limb was fixed in the door. There could be no *ecchymosis* perceptible for some hours after the injury. With the circumstance of an open wound, where the bone protruded from the skin, there would be no *ecchymosis* at all, on that part of the leg. If the *fibula* were broken in the manner supposed, I would have expected *ecchymosis* near that part of the leg. So far as the fracture of the *tibia* is concerned, the escape afforded to the blood would prevent *ecchymosis* in the case of injury by a blow,—not in that of more diffused injury, as from a carriage wheel. It is not possible now to say, whether the fracture was skilfully treated. Some would have removed the protruding part of the bone—I should have done so; but there is a difference of opinion on this subject. If attention was not particularly directed, in dressing the limb, to the fracture of the *fibula*, it is quite possible that the *ecchymosis* there might have escaped attention. It would be on the opposite side from that on which the fracture occurred. Unless the investigation was very particular, and was directed to this circumstance, it might easily escape observation; especially in the circumstance of a broken limb, which is moved as little as possible.

"Examined by the Court.—The injury could not have happened from a fall at the door. A blow from a poker on the shinbone would have broken the *tibia*; but a separate blow must have been inflicted on the *fibula*, in order to break it at the part where it is broken. If both the bones had been broken, it is scarcely possible he could have walked to the door. If the bone did not protrude, the fracture would not have been observed by the person who took off the stockings. The fracture might be *simple*, and afterwards become *compound* from the fall. The appearance of blood when the stocking was taking off, may be accounted for by the skin being bruised by the poker, and not by the bone protruding. If the squeeze in the door caused the fracture, I think there must have been discoloration. *Delirium tremens* is an expression used in different meanings, but frequently employed to designate a state consequent upon fatal fractures. A similar state, or common *delirium tremens*, is produced by excessive drinking; and a person of dissipated habits is more apt to suffer from such an attack, in consequence of injury. It is very frequent that *delirium* comes on shortly after a serious fracture, and continues till death. I think this man was predisposed to *delirium tremens*, but that the fracture caused his death.

"Cross-examined by Mr Anderson.—*Delirium* often comes on before inflammation. It is a symptom of dangerous disease, sometimes occasioned by the withdrawal of a stimulant, to which the patient was accustomed. I should not have expected this man to have had *delirium* without any fracture; because it is not consistent with my observation, that the withdrawal of stimulus is a frequent cause of delirium. It is more frequently produced by a contrary cause. The state of the bone does not seem to have been produced, either in disinterring, or in amputation. The *dead part* of the bone might be produced by a fall. It is evidently recently dead,—has no connection with the previous lameness of the patient. The appearance of the *comminuted* part of the bone might have been caused by a fall; but the squeeze was a more probable cause. In the case of a squeeze, there might be laceration of the integuments,—but more probably not. There must in all probability have been *ecchymosis* within three days, *in whatever way the fracture was caused.* Therefore, its not having been observed must have been from the want of sufficient examination. If a severe blow had been given on the shoulder with the poker, there must have been *ecchymosis* within three days.

"By the Advocate-Depute.—A fall on level ground could not have occasioned this fracture.

"By the Court.—Had such a case occurred in my practice, I should certainly have removed the protruding bone. But this is matter of opinion. Fractures of this kind are always attended with danger."*

Dr Malcolm of Perth, and Dr Smith of Forfar, concurred in these opinions.

For the defence it was contended that the fracture had been occasioned by the deceased falling on the smooth stones at his own door; that the tibia had been fractured alone by the fall; and that the head of the fibula had been broken by "rough handling" after death; that if the fracture had been caused by external violence, there would have been ecchymosis; that the deceased could not have walked a few steps after the fracture, even supposing the fibula had remained entire; and that the dead appearance of the bone could be accounted for by its protrusion or subsequent gangrene. As these opinions were received with much attention by the court, and probably led the jury to decide that the fracture had not been caused by external violence, though they found unanimously "the pannel guilty of an assault to the effusion of blood with the poker libelled." I therefore take this opportunity of considering their soundness and testing them by some cases of recent occurrence in the hospital.

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* Reports of Cases before the High Court and Circuit Courts of Justiciary. By Archibald Swinton, Esq. pp. 189, 190.

1. Is it possible that a simple fall on a level surface, without other impulse, could cause a compound fracture of the leg? Or is it possible, that the tibia, if broken in this way alone, the fibula remaining entire, could project three or four inches through the wound? From all that I have seen or heard, I believe that both of these questions, and especially the latter, must be answered in the negative.

2. Could the head of the fibula be broken into small pieces by the rough handling of the limb? To say nothing of other obvious objections, which must readily suggest themselves, I may merely remark, that this explanation requires it to be believed that the fibula remained sound while the broken end of the tibia projected three or four inches through the wound, which is impossible.

3. Is it impossible to walk a few steps after fracture of the tibia? And

4. Is the presence of ecchymosis a necessary or never absent consequence of compound fracture caused by external violence? These questions will be best answered by the two following cases.

Fracture of the thigh-bone—patient able to walk—dissection.—Alex. Maclean, aged 76, applied at the Infirmary on the 6th of November, on account of an injury from falling on his side a little while before. By mistake he was taken to the medical department of the establishment, and then walked with the assistance of a stick to the Surgical Hospital, distant between one and two hundred yards, and approached by descending a pretty long flight of steps. It appeared on examination that his right thigh-bone was broken near the neck. As sometimes happens in old people who have suffered this injury, he gradually sunk and died on the 16th. On dissection it was found that the fracture extended through the trochanters, which were completely detached from the shaft of the bone. In the summer of 1829, Dr L. of Strasbourg, while travelling in the Highlands, broke both the bones of his leg, and afterwards travelled 170 miles by a variety of conveyances, to place himself under my care here. On his arrival, the third day after the accident, before I saw him, he went into a warm bath without any bandage on the limb. Mr Crichton of Dundee informs me that he "recollects of a patient of his, under the influence of *delirium tremens*, dancing about the room, with both bones of the leg fractured near the ankle, and protruding through the integuments." In fracture of the tibia *alone*, of which injury I have happened to see a great many cases, there is hardly any displacement of the broken surfaces, and of course much less difficulty in using the limb.

Compound fracture of the leg complicated with pregnancy—recovery.—Mrs Mann, aged 48, was admitted on the 14th of June, soon after sustaining a compound fracture of the left leg, from the wheel of a carriage passing over it. The wound was over the tibia, about a third down the leg. The fracture was comminuted, and it appeared that the wheel had passed obliquely over the thigh just above the knee. The patient was between three and four months advanced in pregnancy. There was no ecchymosis in the neighbourhood of the wound either immediately after the injury, or at any time afterwards. But the skin over the knee and lower part of the thigh exhibited the purple colour of effused blood; and in the course of a few days sloughed so as to expose a large coagulum lying under it. The patient suffered greatly from extreme irritability of stomach, and profuse discharge, which was maintained by the exfoliation of many pieces of bone from the broken extremities of the tibia. She has now the prospect of soon getting well, with a limb little if at all altered in appearance.

This case, which occurred two months after the trial at Perth, affords a very satisfactory confirmation of the opinion then expressed, in regard to the appearance of ecchymosis in connection with compound fractures. It also exemplifies, by the separation of so many exfoliations, how readily the dense osseous tissue of the shaft of a bone such as the tibia, is killed by severe concussion or contusion. In contrast I may mention a case which Dr Begbie asked me to see about the same time. The patient was a gentleman who, in leaping over a fence, had fallen so as to suffer a compound fracture of the leg, not by force acting directly on the tibia, but by the strain at its extremities. There was here very little discharge of matter, and no exfoliation. In regard to ecchymosis, it should be recollected farther that the interstitial effusion of blood from external violence, and discoloration of the skin, are not necessarily connected; that the former may exist without the latter; and that the appearance of it will be sooner or later from a few hours to as many days, according to the depth at which the effusion is seated.

Fracture of the nose, humerus, thigh-bone, and patella—recovery.—Barbara Ramsay, aged 40, was admitted on the 24th of November, having the preceding evening fallen into an area and suffered a very complicated injury. The nasal bones were broken and detached from the cartilage, the left humerus was fractured at its neck, the right patella was fractured transversely, and the right thigh-bone was fractured about its middle. In former reports I have mentioned cases of fractured thigh which admitted only of treatment on the inclined plane, as one where the knee was stiff, and another where the leg had been amputated. In this case, again, the straight position was evidently necessary, and the long splint of Desault was employed. I am still of opinion that it is in general the best apparatus for treating fracture of this bone.

Tumour of the groin simulating an aneurism—removal—dissection.—Alexander Lyne, aged 54, was admitted on the 14th of November, on account, as it was supposed, of aneurism of the external iliac artery on the right side.

"The right inferior extremity is much enlarged from the groin down to the toes, owing to œdematous swelling. In the right iliac region there is to be felt a circumscribed oval tumour, extending from Poupart's ligament to the anterior spinous process. It is tense, insensible to pressure, and pulsates obscurely throughout its whole extent. When the stethoscope is applied, pulsation and the bellows sound are very distinctly perceived. The patient has no other complaint, except some uneasiness in making water. In the month of March last, while carrying a heavy bag of grain down a stair, he missed the step with his left foot, and suddenly transferred the entire weight of his body and burden to the right limb. At this instant he felt a sharp "stang" in the right flank. A fortnight afterwards he observed that the thigh was swollen, and in a week or two more felt the tumour of the groin." In lecturing upon this case, I stated the difficulties which attend the diagnosis between aneurism of deep-seated arteries and tumours lying over them, and mentioned the remarkable instances of deception from this source which have been published by Messrs Guthrie and Earle, and Dr Nicol of Inverness. Under the circumstance above related, and especially the history of the disease, there seemed great reason to believe that an aneurism existed, and that the ligature of the common iliac would effect its cure.

On the 20th I made an incision with this view in the right flank. It was about six inches long, and extended from over the inner aperture of the inguinal canal, upwards and outwards, in a semilunar direction, with the convexity towards the crest of the ilium, and about an inch distant from it. On dividing the muscles, I felt that the tumour was solid, and then resolved to attempt its removal. When the *fascia transversalis* was cut through, the surface of the tumour came into view. I carefully detached it from the peritoneum, and succeeded in getting it away entire. It was about the size of an egg, of a mixed grey and blackish colour, and cerebriform consistence. For three or four days the patient seemed to be doing well. The œdema in a great measure disappeared, and there was a copious flow of urine. He then gradually declined in strength; and without any definite complaint continued to sink until the 27th, when he died. On dissection, a chain of tumours similar to the one removed was found surrounding the great vessels on *both* sides of the pelvis up to the bifurcation of the aorta. They adhered in most places inseparably to the coats of the vessels, and at one or two parts projected into the interior of the vein.

Popliteal aneurism—ligature of the femoral artery—recovery.—James Thompson, aged 39, a Leith porter, was admitted on the 9th of May. "Of healthy appearance, and has never suffered from any severe illness. Six months ago, while carrying a bag of grain along a plank which lay on a heap of grain, he missed the plank with his left foot, which sunk into the grain to the depth of two feet, and he fell on his left side so as twist the limb under him. He continued his work, but in the course of a few hours observed some pain and swelling of the knee, which continued for two days, but did not prevent him from working. He remained well for three weeks, when he felt pain in the calf of his leg, and observed that his toes were white, which they ceased to be when rubbed and held near the fire. About the same time he felt a swelling like a pea in the left ham, which gradually increased, and in the course of three weeks was observed to pulsate. There is now a circumscribed aneurism filling the popliteal cavity. There is no pain, but a feeling of weakness in the foot."

I tied the artery in the usual way. No uneasiness of any kind, local or general, was experienced. The ligature separated on the nineteenth day, and the patient was dismissed on the 21st of June.

Popliteal aneurism—ligature of the femoral artery—recovery.—Charles Simpson, aged 51, groom, admitted on the 15th of July. The aneurism in this case was much larger and more diffused than in the one just related, and the leg was much swelled by œdematous effusion. The patient attributed his complaint to a strain which he had suffered three months before, in carrying a bag of grain down a stair.

I tied the femoral artery on the 22d, and the ligature separated on the 10th of August. The wound healed by the first intention, and no inconvenience was experienced from the operation, except some uneasy feelings in the foot and calf of the leg. The œdema speedily disappeared. Neither in this case nor the former one was there almost any perceptible alteration in the temperature of the limb caused by obstructing the vessel.

These cases are interesting from the resemblance of their histories to that of the inguinal tumour; but my chief reason for mentioning them is to have an opportunity of suggesting a different explanation of the serious effect which has occasionally been produced in the circulation of the limb by ligature of the femoral artery, from that which is generally given and received as sufficient. The mortification thus caused is ascribed to the violence of the reaction that succeeds the diminished force of the circulation, and I do not mean to deny that such *may* be the case; indeed, I had once occasion to witness it; but that the same effect may happen in a different way, and probably does so more frequently, will, I think, appear from the following considerations.

Last summer my lamented colleague, the late Mr Turner, tied the femoral artery in a case of popliteal aneurism. The tumour was small and recent, and the limb was apparently sound. In the evening the foot was deadly cold, and the patient felt very uncomfortable, with a quick pulse and much heat of skin. Next day his pulse was 120, he had slept none. The foot was perfectly cold, and the superficial veins were distended. In the course of the succeeding days the toes shrivelled, and the calf of the leg became very painful, with an inflammatory blush of the integuments, while in the lower part of the limb, dark-coloured phlyctenæ appeared. Amputation above the knee was performed on the sixth day after the operation, when it was observed that the veins were firmly plugged by coagulum. The patient in some respects improved after this, but did not gain strength, and finally died a week or two after the amputation. On dissection the femoral vein was found thickened in its coats and filled with a mixture of pus and coagulum *opposite* the part of the artery which had been tied, and from which the ligature had separated, up to the groin. Above and below this, the vein seemed sound, and especially downwards to the stump its coats were quite natural in appearance. It is evident that in this case the femoral vein had been inflamed, and that it was so in consequence, not of the amputation, but of the ligature of the artery. If we suppose that the first steps of this inflammatory condition immediately succeeded the operation, a complete explanation of the mortification will be afforded. Coagulation would then occur, and if this be ascribed to the irritation suffered by the vein during the operation, the succeeding inflammation is not to be regarded as a necessary consequence. In the following case also, related by Mr Travers, I should think there was coagulation in the vein.[*]

" William Cannon, æt. 45, a labourer from the country, and apparently a strong, healthy man, was admitted 28th August, 1834, for a popliteal aneurism of moderate size.

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[*] Travers's further Inquiry concerning Constitutional Irritation, p. 187, 1835.

"Sept. 5th. The operation of tying the femoral artery was performed to day. On opening the sheath profuse hemorrhage occurred, and as the bleeding proceeded from the upper part of the incision, the opening of the sheath was extended, and the ligature placed higher upon the artery, when the bleeding and the pulsation of the tumour ceased. A second ligature was placed below the first, and the artery divided between the two: the external wound was then closed, and the patient replaced in bed. The foot shortly became cold; hot bottles were immediately applied to the limb.

"7 P. M. Foot still cold; complains of a numbing cramping pain in the leg and foot; is exceedingly restless; pulse full and soft, but rather quick; tongue moist. *Tinct. opii m.* xxx. *mist. camph.*

"6th, 1 A. M. Pain and restlessness continue; the leg and foot still cold, and marked about the inner malleolus, with a dark blue streak. *Rept. haust. anod.*

"10 A. M. Pain considerably abated, and is more comfortable, limb cold; blueness increased; pulse 72; tongue moist; has slept since the last report.

"2 P. M. Quite free from pain; the foot and leg are warmer; has been dozing all this morning.

"8 P. M. The foot and leg very cold when the hot bottles are removed; the blueness is increasing in all directions; and sensation is lost in many parts, as on the dorsum of the foot, above the internal malleolus, in the toes, and over the *tendo Achillis.* The limb has been constantly rubbed, since the last report, with hot flannels.

"7th, 8 A. M. The blueness increases, and is mixed with yellow; hard, bright, semitransparent surface of the foot; all beneath the skin seems adherent to it; complete loss of sensation of the foot and lower part of the leg. Friction has been continued all night, which has kept him awake; feels faint and tired; pulse 75; excessive pain about the calf of the leg, excited by the lightest touch. *R. Amm. carb. gr.* v. *tinct. hyosc. m.* xv. *ex. mist. camph. 4 hor.*—beef tea.

"8 P. M. He complains of more pain in the leg, of a pricking, shooting character; the discoloration extends to within three inches of the head of the fibula, and bounded by an indistinct white line, which is acutely sensible on the inner side of the leg; pulse 84; slight thirst; rubbing discontinued in order that he may sleep; flannels applied.

"8th, 6 A. M. Slept some hours; temperature natural above the line; no pain except when touched, then it is acute; much swelling and tension of the calf of the leg, which when touched is acutely painful; the foot and ancle and some space below the middle of the leg, is brown, hard, dry, glazed, cold, and insensible.

"6 P. M. The white line is more distinct; all below this is darker than before; this line, and the swollen leg even to the knee, are acutely sensible and painful to the touch. Opium to be continued at night; bowels not open since the operation. *Extr. coloc. co. gr.* xv.

"9th. 10 A. M. Has passed a good night; pulse 90; limb as yesterday.

"10th. 10 A. M. Has suffered a great deal of pain in the leg and foot, which he described as seated close to the bone; the cuticle upon the leg raised in a few places into small vesicles; two evacuations; pulse rather quick.

"11th, Passed a good night, having less pain; pulse 90.

"15th, Continues much the same, sometimes in much pain, at others quite easy. The leg is black, with several vesications, and very much swollen and tender; bowels regular; pulse 90; very irritable.

"16th and 17th, Much the same.—*T. opii m.* xv. 6. *horis.* The discoloration has spread considerably upwards since yesterday.

"18th, Amputation by the circular incision was performed above the knee; much venous hemorrhage, and four arteries of large size secured.—*T. opii m.* xxv. and a little wine were ordered.

"6 P. M. Quite comfortable: a slight discharge from the wound has already taken place; pulse 100, and small; skin moist.

"9 P. M. Opium repeated; wine and water to be given during the night.

"From this time the patient did as well as possible in every respect, and the stump soon healed."

There was here, no more than in Mr Turner's case, any violent action following the operation, to account for the death of the foot, which became cold immediately after it, and never regained warmth; and it cannot be supposed that the mere obstruction of the artery, which in general produces hardly any inconvenience, should in these cases have proved directly fatal to the limb. Other cases which might be mentioned confirm me in thinking, that when the ligature of the femoral artery is followed by serious effects in the circulation of the limb, sometimes the vein also may partake of the obstruction. And the practical inference from this view is, that caution ought to be observed in performing the operation, not merely to avoid denuding the coats of the artery too much, which might lead to hemorrhage, but to beware of treating the vein roughly, lest the irritation of its coats cause inflammation of them or coagulation of their contents.

Medullary tumour of the spermatic cord—excision—recovery. Donald Fraser, aged 35, from Ross-shire, was admitted on the 31st of May. He stated that, about twelve years ago, he observed a small moveable tumour over the right cord where it issues from the external ring, which remained in the same state until four months before the time of his admission, when it suddenly began to enlarge; and that it had since then progressively increased in size. It had not extended upwards, but occupied the whole of the right side of the scrotum, which was greatly distended, and completely concealed the testicle.

The tumour was removed on the 3d of June. When divided it displayed the testicle lying quite sound at its lower part, closely embraced by the morbid growth, and inseparably adherent to it. The characters of the cerebriform structure, very well marked, were at the same time presented to view.

Adipose tumour of the back—removal. Mrs Young, aged 44, was admitted on the 2d of July, to have a large fatty tumour removed from her back. It had commenced about five years before, was increasing with accelerated rapidity, and had become very painful. It was easily removed, and she was dismissed on the 19th. I mention this case as an example of what happens more frequently than is generally supposed, viz. an adipose tumour becoming the seat of uneasy sensations. This has been ascribed to degeneration of the growth into a morbid structure of some different kind. But I have repeatedly sought in vain for any sign of such a change in cases where the patient had suffered greatly from pain in the tumour.

Stricture of the œsophagus from swallowing sulphuric acid—recovery.—Archibald Menzies, aged 40, from Perthshire, was admitted on the 22d of December. He stated, that, in the month of April 1833, he swallowed, instead of whisky, about half a wine-glassful of diluted sulphuric acid, which he had got for curing the foot-rot in his cattle. Violent pain and efforts to vomit were immediately excited, and for several days his life was considered in danger. When beginning to recover, he experienced a difficulty of swallowing, which gradually increased, until he became unable to get down any solid food. Some relief was effected by the passage of a small bougie; but latterly his complaint had proved more and more distressing. He had subsisted chiefly on boiled milk, "soft sowens," and the watery part of broth. He was much reduced, he said, in flesh and strength, but still showed the appearance of a sound constitution.

I found a tight stricture at the commencement of the œsophagus, which admitted only a bougie equal in size to No. 1 of the urethra scale. The contraction was of small extent, and readily yielded to the successive introduction of larger bougies every third day. He soon became able to swallow more easily, and at length felt hardly any difficulty in the deglutition of tough and large morsels. He was dismissed on the 24th of February.

Stricture of the œsophagus from scirrhous degeneration of its coats—death—dissection.—Fanny Harkess, aged 35, was admitted on the 28th of March. For several years she had experienced some difficulty in swallowing, but not to a serious extent, until some months before, when the complaint increased, and continued to do so afterwards until the time of her admission. She was very thin and weak, and had the appearance of a person labouring under malignant disease. Her breathing was somewhat affected. On examining the pharynx with my finger, I felt an irregular mass opposite to the epiglottis; and when the throat was carefully examined externally, a thickening, with tenderness to pressure, could be felt behind the cricoid cartilage. In these circumstances, I concluded that the case did not admit of any remedy, and resolved not to harass the patient by attempts to dilate the stricture, since they must not only prove useless, but be productive of injury by exciting the disease to increased activity. Whether it was from the irritation suffered in the examination of her complaint, or from the change of residence, or simply from the progress of the disease, the patient became worse after her admission, and died on the 3d of April.

On dissection, a dense white tumour of a flattened form was found occupying the lower part of the pharynx and commencement of the œsophagus. It ascended on each side of the *rima glottidis* about half way up, and contracted the gullet so as to leave hardly sufficient room for the passage of the smallest sized bougie.

Stricture of the rectum—recovery.—Robert Stevenson, aged 45, was admitted on the 16th of May. He had suffered from stricture of the rectum for four years, but was not aware of the nature of his complaint until I examined the gut. The stricture was about two inches distance from the orifice, and so tight that the point of my finger could not be introduced into it. Bougies, gradually increased in size, were passed every third day, until the largest that seemed necessary entered with ease. He was dismissed on the 28th of June.

I mention this case in order to repeat the observation made formerly in these reports, that curable stricture of the rectum does not occur more than two inches distant from the anus. In almost all the cases where it is supposed to exist farther up, the symptoms depend upon atony of the bowel or some other functional derangement, and the resistance encountered in passing bougies proceeds from the promontory of the sacrum, or the loose folds of the intestine being pushed before the instrument. It is of the utmost consequence that the public and the profession should be fully aware of this, to protect the former from the empirical practices of surgical adventurers, and the latter from engaging in attempts which can be productive only of discomfiture to themselves, and useless annoyance to their patients.

The Tendo Achillis divided, and healed with separation between the extremities—Removal of the intermediate substance—Recovery.—Isabella M'Kay, aged 21, from Jedburgh, was admitted on the 19th of January. She stated that in the month of August last, while engaged in reaping, she had the tendon of her left leg completely divided about an inch and a quarter from its insertion into the heel by the hook of her neighbour. She was conveyed to a medical man at some miles distance, who treated the injury as a superficial wound. At the end of five weeks the wound being healed, she found that the limb was of hardly any use to her in walking, and experiencing little or no improvement afterwards, she came to town willing to suffer any thing that might lessen her lameness. There was a very obvious depression at the injured part of the tendon, and when the foot was placed at a right angle with the leg, the separated extremities were distinctly felt at the distance of an inch and a half from each other. A small transverse cicatrix showed where the wound had been. The patient had no power of raising the heel from the ground, and in walking seemed rather to carry the limb than to be assisted by it.

An incision about three inches in length was made along the tendon, passing over the defective part, and then two small transverse ones including the cicatrix of the former injury. The flaps thus formed were reflected so as to expose the tendon, and shew distinctly the situation of its retracted extremities. The tough fibrous substance which lay between them was next carefully removed, and while the foot was held firmly extended, two stitches were drawn through the ends of the tendon so as to bring them very nearly into contact. Petit's apparatus for ruptured *tendo Achillis* was lastly applied. The wound healed almost entirely by the first intention, and the patient did not suffer the smallest local or constitutional disturbance. She was dismissed on the 7th of March with greatly increased command over the foot, and with the prospect of regaining the use of it completely when the stretching and consolidation of the parts should enable her to dispense with a high-heeled shoe. Dr Hilson of Jedburgh, informs me that this prospect is now nearly realized, and that the state of the limb is still improving.

Along with this case I may mention one of an opposite kind which occurred at the same time, and tends further to show that the tendons may be treated with considerable freedom. A young gentleman engaged in a mercantile house of Liverpool, had an inflammation of the right foot and ankle, which was followed by a contraction of the *flexor longus pollicis*, that rendered him quite lame. When the ankle was extended the great toe could be brought into a line with its neighbours, but whenever the foot was bent to a right angle with the leg, or the slightest effort was made to raise the heel, the great toe became arched, and a sensation was experienced, which, if induced by an attempt to walk, instantly made the patient desist from it with a feeling that the least perseverance would be followed by a fall. Having tried a variety of remedies without success, and finding himself quite unable for the discharge of his duties, he returned to his friends here, and I was asked to see him. Some means having been suggested and employed for a few weeks with no better success, I proposed to try the effect of dividing the tendon and healing the wound with the toe extended. The patient readily assented, and the operation was performed in the following manner. I made a small longitudinal incision along the middle of the proximal phalanx of the toe, through the integuments, and then rendering the tendon as tense as possible turned the edge of the knife towards it and made a transverse division. A narrow wooden splint was next fastened to the instep; a cushion of lint was interposed between it and the root of the toe, the apex of which was lastly drawn towards it sufficiently to stretch the tendon to its full extent. The wound was completely healed in a couple of days, and the patient the next time I happened to see him afterwards was walking with no perceptible lameness or inconvenience. My object in making the incision through the integuments in a longitudinal direction was to prevent the edges of the wound from being separated by the requisite stretching of the toe, which of course would have prevented primary union, and led the way to a troublesome inflammation that must not only have delayed recovery, but might even, by the adhesions consequent upon it, have defeated the object of the operation.

Exostosis of the thigh-bone—removal—recovery.—William Scott, aged 16, was admitted into Minto House on the 27th of January to have a growth removed from the thigh-bone. It formed a troublesome tumour immediately above the inner condyle, raising the *vastus internus*, and rendering motion of the limb painful. I cut through the muscle and divided the narrow neck of the exostosis with cutting-pliers. Notwithstanding every precaution the wound did not heal by the first intention, and considerable inflammation, followed by a profuse discharge, took place. I feared that the joint from its proximity might become involved, but it fortunately remained free from disease, and the patient got quite well.

Exostosis is common in this situation, but seldom requires removal, as it generally ceases to enlarge after a time, and the patient becomes habituated to its presence. Very different is the case of exostosis growing from the distal phalanx of the great toe, where, whatever be its size or term of duration, it always occasions lameness. In former reports I have noticed this very troublesome affection, and advised excision of the growth, in preference to amputation of the toe, which has been recommended and practised. In every case of this kind that has come under my observation, with the exception of one which did so lately, the disease has affected the great toe. In this instance a young lady had been rendered lame for two years by a large exostosis proceeding from the distal phalanx of the little toe. I treated it in the usual way, that is, by making an incision on each side of it, and then dividing the neck with cutting-pliers. In one case only also have I seen this disease in a distal phalanx of the hand. The patient was a young woman from the country who had been rendered unable to gain her livelihood by sewing, in consequence of an exostosis growing under the nail of the thumb, precisely similar to those met with so frequently in the feet. It was removed in the way just described, very much to her satisfaction, as she had been told that amputation was the only remedy.

Subcutaneous nervous tubercle—removal.—Alice Manderson, aged 16, was admitted on the 30th of May. Her complaint was a small circumscribed moveable tumour, not much larger than a pea, seated under the skin on the side of the proximal phalanx of the ring-finger. It had existed two years without suffering any change. She frequently felt severe pain in it, and could not bear the slightest pressure. I cut it out, and as the wound healed by the first intention, she was dismissed in a few days. The tumour had a yellowish grey colour, and the consistence nearly of a lymphatic gland.

It has been noticed, and I have had occasion to see the observation verified, that the small wound required for the removal of these painful tubercles seldom heals by primary adhesion, and generally proves much more troublesome than might be expected from its size. The case just related afforded an exception to this rule, but in other respects, and especially the sex of the patient, the situation of the tumour, and the symptoms proceeding from it, it agreed perfectly with the usual features and history of the disease. The best account of subcutaneous tubercle has been given by Mr William Wood of this city;* but the following case is different from any he has described, and, therefore, may be noticed here. Some months ago, a middle aged lady from the country consulted me in regard to her little finger, which for eight years had been the source of great uneasiness to her. What she complained of was severe pain under the nail, not constant, but occasional, and lasting for hours at a time. Pressure, exposure to cold, and mental excitement, brought on these attacks. In cold weather she was frequently kept awake great part of the night by pain. Until twelve months before the time I saw her, she had not been able to perceive any difference in the appearance of the nail from that of the others, unless it might be a slight discoloration at its root, but since then it had become distinctly arched from side to side. She was willing and anxious to have the finger amputated, believing that there was no other remedy, and being determined to obtain relief if it was possible to do so. Before proceeding to the severe measure she contemplated, I obtained her consent to cut away the convex part of the nail, as I thought it not unlikely that there might be some morbid growth under it, admitting of removal. Having done this, I observed that, along with the nail, I had taken away the half of a small round tumour, of a yellowish colour, and firm pulpy consistence. The other half lay imbedded in the matrix of the nail, and was readily turned out with the point of the knife, seeming to have hardly any connection to the subjacent texture. The patient returned home immediately, and having heard nothing to the contrary, I conclude she has been completely relieved.

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* Trans. of the Med. Chir. Soc. of Edin. Vol. iii. 317.

Loose cartilages in the knee-joint—removal—recovery.—George Scott, aged 35, farm-servant, was admitted on the 15th of July, complaining of occasional pain in his right knee. The joint was not swelled or otherwise altered in appearance, but he stated that it frequently became very stiff and sore, so as to prevent him from using the limb. On examination two moveable bodies were found in the joint, and he then informed me, that he had noticed one of these twenty years ago, soon after making an exertion with the leg, and feeling a sort of snap in the knee; that it troubled him occasionally for eight years and then ceased to do so; and that last November he again began to suffer from it together with another one which then appeared for the first time. Since that time he had been greatly distressed, and latterly felt unable to follow his employment.

The danger of removal having been fully explained to him, he determined on submitting to the operation, having no prospect of supporting himself and family unless relieved from the complaint. Having guided the bodies to the flat surface of the external condyle, and held them firmly there, I made a free incision upon them, so as to allow their escape without any other assistance than slightly raising the edge of the larger one, which had a flattened form. The wound was closed by two stitches of the interrupted suture, a splint was applied under the limb to keep it straight and rigid, and cold wet clothes were diligently employed to prevent undue excitement of the cut surfaces. They united completely by the first intention, and the patient was not in the slightest degree affected in regard to his tongue or pulse, or in any other respect. Four days after the operation the splint was taken off, and he was considered quite well, when a violent rigor, attended with sickness and headach, ushered in an attack of erythema, which engaged the right inferior extremity from the middle of the thigh downwards. As the knee-joint remained free from derangement, there being in it no fluid effused, pain on motion, or tenderness of pressure, this attack must be regarded as accidental, or, at all events, not depending upon the wound of the articulation.

The patient has a moveable body in the other knee, but having never experienced any inconvenience from it, probably owing to its large size, which prevents it from remaining between the articular surfaces, and makes it lie always on one or other side of the patella, had made no mention of its existence, which was discovered accidentally by my clerk Dr Dunsmure. The bodies removed had the usual irregular tuberculated surface, and pearly lustre of such formations, but were composed almost entirely of bone with a very thin crust of cartilage covered by a sort of tough capsule.

Excision of the elbow-joint—recovery.—James Tainsh, aged 8, from Stirling, was admitted on the 26th of May. He had hurt his elbow by falling on it in the month of December last, since which time the motion of the joint had become gradually impaired, abscesses had formed, and large ulcers opened leading down to the bone. I cut out the joint on the 31st, in the usual way. The patient suffered so little disturbance from the operation, that he could be with difficulty confined to bed; and in two or three days was going about as if nothing had happened. He went home on the 25th of June. I mention this case merely with the view of remarking, that increased experience of the effects produced by this operation confirms my opinion of its utility; and its general introduction into practice, which seems now nearly accomplished, will soon render it unnecessary to say any thing in its favour.

Rupture of the bladder by a fall—dissection.—Isabella Robertson, aged 26, was admitted on the 12th of July, suffering from the effects of an injury which she had sustained the day before by falling forwards on the edge of a tub. She had fainted immediately afterwards, and upon recovering her sensibility, complained of intense pain in the abdomen, together with inability to pass her urine. On her admission the catheter was introduced, and a moderate quantity of water drawn off. Symptoms of peritonitis being then distinctly marked, she was repeatedly bled with leeches, and took large doses of opium with great relief. For several days the amendment was so decided, that sanguine expectations were entertained of her recovery; but she then relapsed to her former state, and died on the 18th, a week from the time of receiving the injury. The history of the case led me, on the whole, to expect a rupture of the bladder; and accordingly a small aperture was found at the fundus, communicating between the cavity of the bladder and that of the peritoneum, which showed traces of intense inflammation, the ruptured surfaces being glued together by effusion of lymph, and the interstices containing dark-coloured serous effusion.

The fatal effect of effusion from the viscera upon the peritoneal surface is too well known to require any illustration by additional instances of its occurrence; but the long time, comparatively with the short space usually required for this effect being completed, which elapsed in this case between the rupture of the bladder and the death of the patient, seems deserving of notice. In judicial questions, the effects of such effusions, and the circumstances attending their production, sometimes come to be of great consequence. My opinion was once asked in a case of this kind, where a man had spent some hours convivially with a few of his friends, after which a quarrel ensued, blows were exchanged, and the parties wrestled with each other. He then walked home a distance of more than a mile, and in crossing the threshold of his own door fell forward on his belly. When lifted up, he complained of great pain in the abdomen, and was put to bed quite unable to exert himself. In the course of two days he died; and upon dissection, the bladder was found ruptured at its fundus to the extent of between two and three inches. In these circumstances, the question came to be, was the rupture caused by the violence of his companions, or the fall at the door? I concurred with the medical attendant of the deceased in thinking, that he could not have walked home after the urine had been extravasated, and that the injury consequently must have been sustained from the fall. The case, therefore, was not prosecuted by the authorities.

Reproduction of bone.—In reference to the observations contained in some of the preceding reports relative to the reproduction of bone, I think it right to mention the following experiments, which are two of several made lately with the view of illustrating this subject. From the fore-leg of a dog, I removed a portion of the radius, an inch and quarter in length, together with the periosteum covering it, and a similar portion from the other radius of the same dog, without the periosteum. This was done by slitting the membrane open, insinuating a curved instrument between it and the bone, and then cutting away with pliers the extent of bone desired. On examining the limbs six weeks afterwards, the bone from which the periosteum had been removed was found very imperfectly replaced, the cut extremities being merely, as Sir A. Cooper has described and represented, rounded off, with conical projections towards each other, and having an intermediate ligamentous substance joining them. The other bone, of which the periosteum had been allowed to remain, instead of this, exhibited a compact osseous mass of equal thickness, and rather exceeding the natural size, completely supplying the vacancy.

In another dog, I separated the periosteum from the bone to the extent of an inch and half, and then interposed between them a piece of tinned iron, bent to the shape of the bone, which it completely surrounded. At the end of six weeks the state of the limb was examined. The wound was completely healed. The periosteum was fully a quarter of an inch thick, being on its inner surface changed into a congeries of slender arborescent vessels, which constituted a velvety-looking mass, so soft and tremulous that it seemed almost of a fluid consistence. The surface of the old bone, where covered by the piece of metal, displayed the same vascular texture. Exterior to the metal, there was at each of its extremities a considerable formation of new bone, rendering the old one thicker; and joining these excrescences, there was at one part a nearly complete osseous shell, formed by plates of bone lying in the substance of the periosteum, and not yet connected with the old shaft.

9, *Charlotte Square*, 18*th August* 1836.

ART. II.—*Observations on Tropical Fever, with allusions to a Narrative lately published by Captain W. F. W. Owen, R. N. of a Surveying Expedition to Africa, Arabia, and Madagascar, in the years* 1822–3–4–5–6. By JAMES WALLACE, Surgeon, R. N.

> "The spots that are canopied by the serenest skies, where the air is the purest to the vision, and the most genial to the feelings—where nature, too, has been most lavish of her charms—are those where the visitations of pestilence are the most frequent and the most destructive; coming as if in mockery of the judgment of man, to show him that spots which seem to him the Edens of the world, are, like the Eden of old, gardens where death lies in ambush."—*Monthly Magazine, March* 1832.

THE subject of tropical fever has at all times, and perhaps especially during the present century, occupied much of the attention of all zealous inquirers into medical science. Upon a large body of medical men, namely, those attached to our army and navy, the consideration of the subject has in a great degree been forced; for wherever our fleets and armies have been, there fever has always prevailed in a certain measure, and frequently to such a frightful extent as to prove more destructive of life than even the sword, or any other of the calamitous circumstances attendant upon war. Naturally enough, under such appalling and often unexpected events, the minds even of the most indolent become roused to exertion; and they who, under ordinary circumstances, would have been content to have plodded on in the common routine path, were now necessitated, from their acknowledged inability to meet the exigencies of the case, to look around them for that increased knowledge which such extraordinary visitations evidently required. And, as was naturally to be expected, the result of these inquiries has been in a great degree satisfactory. Though we have still much to learn, we have learned a great deal. We can now not only treat the disease with some reasonable hope of success; but, what is better, we can occasionally prevent it; and upon these two points principally, namely, its prevention and cure, I take the liberty of offering the observations which follow.

The question "whether tropical fever is contagious" has, I apprehend, been nearly altogether determined by an almost unanimous answer in the negative. Whether it may not, by long continuance, and under peculiar circumstances, acquire contagious or infectious properties, is a matter about which there still may very reasonably be some doubt. But as to the idea that it spreads by contagion, when it appears as an epidemic either in our ships, or on shore, we suspect there are but few who have actually seen the disease, and who have dismissed from their minds all preconceived opinions regarding it, will ever become converts to such a doctrine. The evidence adduced, from all quarters, has surely been quite sufficient to establish the fact, that, within the tropics, or in climates possessing nearly a tropical heat, and especially in particular situations, there are certain exhalations arising from the soil, or its products, which, when brought into contact with the human body, will give rise to that assemblage of morbid phenomena constituting what is termed fever. What may be the nature of these poisonous exhalations, and in what way they do their deleterious work, we do not pretend exactly to know; neither can we always tell with certainty the particular situations in which they abound; but that such exhalations are in existence, and that myriads have been destroyed by exposure to them, are circumstances which unhappily, have been satisfactorily demonstrated by the most ample and melancholy experience.

The soil, which we are in the habit of supposing most apt to throw out these baleful effluvia, is that which contains rather a superabundant supply of water, with vegetable, and perhaps animal matter in a state of decomposition or decay; in short, all fenny and marshy situations, such as are known to prevail on all flat coasts, by the banks of rivers, &c. &c. But as it frequently happens that, even upon high and apparently dry ground, we find the same deadly influence in existence, we are led to the conclusion that marsh—absolute marsh—is by no means essential to the production of these miasmata. Indeed, wherever we find the ground thickly covered with wood, although unable to detect any thing like excess of moisture, in that situation we may reckon, almost with certainty, on finding the seeds of fever in abundance. Nay, when neither moisture nor vegetation are to be found, we may still have the same enemy to contend with; for it would appear that in certain soils, independently of aid either from moisture or vegetation, there are processes continually going on inimical to health, and destructive of life in an eminent degree. That soil in which calcareous matter predominates has been supposed adequate to the production of the febrific poison, but the observations which have as yet been made upon this point have been too few to establish any thing like a fair conclusion. It ought, however, to be remembered continually that a soil, although dry on the surface, may be swampy beneath; and that situations apparently so elevated as to be beyond the reach of any excessive supply of water are sometimes not so in reality. Ground may be percolated—perhaps deeply and generally percolated—by water from some more elevated and distant soil; and, in a word, so erroneous may be our calculations, and so unexpectedly may the potent poison make its appearance, that it behoves us to be suspicious of all situations, either within, or bordering on, the tropics, until time has evinced their salubrity or otherwise.

Certain things, however, appear to be necessary to give efficacy to these malignant effluvia; and the first is, that they must reach the body with a certain degree of concentricity. A vessel, for example, may lie even to leeward of a swampy coast, and yet, if she is at a considerable distance from the shore, so that the miasms are well diluted ere they reach her, she will either escape fever altogether, or a long period will elapse before she suffer from it. Or a body of troops may be encamped in the neighbourhood of a marsh, so that the marshy exhalations are moving directly towards them, and yet, if a piece of high ground or any other obstructing body should intervene, which shall arrest their progress for a time, and so allow them to be in some measure broken and dispersed, these troops may remain comparatively healthy.

Another circumstance which appears to favour the action of the febrific poison is, the body being in a state of inactivity. Men, we know, may day after day be in the most unhealthy situations with perfect impunity, if the body be continually kept in action; witness sportsmen and others who take laborious exercise. But let them cease from their toil;—let them sit down, for example, on the ground, and expose themselves for a time to the pestilent breath which is around them, and almost as certainly as they do, the seeds of fever are sown. In the same way, we have some reason to think that activity of mind is a protecting influence; at least it has been confidently said, that an invading or besieging army will sometimes remain nearly free from disease, so long as victory appears certain; but that with a reverse of fortune comes a corresponding deterioration of health; with the destruction of hope the destroying epidemic makes its appearance.

To be in the neighbourhood of pestilent ground, too, during the night, we believe to be exceedingly dangerous; for there is every reason to think that during that period the miasms are sent forth both more abundantly and more virulently than during the day; and, above all, is it dangerous to sleep at such a period in an unhealthy exposure; for then, in addition to the unusual virulence of the effluvia, the body is exposed to them in a perfect state of quiescence. The season of the year, we know, has also much to do with their production, virulence, &c. &c. it having been always observed that when the earth has received an additional quantity of moisture, and when the solar heat is in the extreme, malarious disease is increased in a corresponding ratio.

Another point which appears to be well established is, that the certainty of being attacked with the disease, the period at which it shall appear, or the virulence which it shall evince, do not appear at all, or at least in any material degree, to depend upon the *length* of time the patient has been exposed to the poison. We believe that exposure for one night, or even for a less period, to miasma having the necessary degree of concentricity, will produce fever just as certainly, as soon, and as violently as if the exposure had been for a longer period. Of course different habits will be affected by this, as well as by other poisons, in different ways; and anomalous cases,—such as perfect immunity from the disease even under the most continued exposure,—will no doubt be occasionally presenting themselves; but in these matters we speak of the general rule, not of its exceptions. Generally speaking, the disease does not show itself until at least ten or twelve days after the morbid impression has been received; oftener it is a fortnight or three weeks; and even a much later period is not uncommon.

It having been frequently observed, however, that many persons who had never been exposed to the influence of the land were attacked with a fever of exactly the same description as that produced by marsh influence,—that in a ship, for example, after having been for a time within the tropics, but without having been at all in the neighbourhood of unhealthy situations, fever might unexpectedly arise amongst her crew, and destroy an immense number,—men naturally enough were puzzled as to how this could take place, and, consequently, felt disposed to look upon malaria as only an *occasional*, not a *constant* cause of this too fatal malady. By many the extreme heat was deemed of itself quite adequate to the production of this fever. By others the want of proper cleanliness, dryness, &c. &c. in the ship were supposed to accomplish the same thing. But at last it came to be stated, and we believe the statement carried very general conviction, that in the wood of a ship, at particular periods, and when acted on by a certain degree of heat, there is a process set up somewhat similar to that which is going on in the marsh on shore,—namely, a process of decomposition or decay, by which are evolved certain gases or effluvia possessing properties of the most deadly character, and capable of producing the widest devastation. Like the effluvia arising from the swamp, the miasms arising from ligneous decomposition are perhaps beyond the reach of our examination; but of their existence, seeing the evidence that has been adduced, we think there can scarcely be a doubt; and we cannot help entertaining the opinion, that their discovery has not only been an invaluable addition to our medical knowledge, but a splendid example of what is to be achieved by a gifted and inquiring mind.

At the same time I do not deny that extreme heat alone, at least heat unaided by marsh influence or ligneous decomposition, is capable of producing fever. On the contrary, I am satisfied it will; but the fever which it produces is, generally speaking, different in character from that produced by marsh influence, and essentially so in these particulars,—that it neither spreads so generally, nor carries off so many victims. That filth, bad ventilation, &c. &c., when occurring in an extraordinary degree, will give rise to disease of a very virulent kind, has been amply shown; but, in these days, such causes can scarcely be taken into the account when speaking of tropical fever as occurring amongst our soldiers or seamen.

At one period the fevers incidental to tropical climates were deemed more of a typhoid than of an inflammatory nature, and stimulants, or tonics, rather than antiphlogistics, were had recourse to for their cure. Then followed a change of opinion both as to the nature of the disease, and the manner in which it ought to be treated. High inflammatory action was supposed almost invariably to exist, centering itself usually in some important viscus, as the brain or liver; and then, as a matter of course, all stimulants were set aside, and antiphlogistics of the most powerful kind, became the favourite remedies. Since then, as in all other things, there have been occasional fluxes and refluxes in the tide of opinion; but, upon the whole, the latter mode of viewing and treating the disease has prevailed, so that at the present day we believe the majority of practitioners will be found in its favour. The correctness of the prevailing opinion, however, there is some reason to question. It is by no means uncommon to find the disease more allied to typhus than to synocha; and I apprehend that those who view it as such, and treat it accordingly, are not only most correct in doctrine, but will be most successful in practice.

That form of tropical fever which is the product of marsh exhalation, I have no hesitation in saying is, in by far the greater number of cases, typhoid or congestive; that is, it is unaccompanied by those intense symptoms which are characteristic of *synocha.* The acute headach, the excited countenance, the ardent heat of skin, the strong bounding pulse, the quick sparkling eye, and the extreme sensitiveness and watchfulness which are the characteristics of inflammatory fever, are either altogether absent, or are present in a very modified degree. The patient, when he presents himself, complains of headach, but it is headach of a dull oppressive kind; the countenance is anxious but not excited; the heat of surface may be higher than natural, but it is not the burning heat produced by intense action; the pulse, although firm and even bounding, is reduced by the most moderate pressure; and there is a degree of apathy and listlessness present amounting in some cases almost to stupor. On the other hand, that form of fever which is merely the product of heat, which is induced, for example, by exposure to the direct rays of the sun, is just as usually inflammatory as the other is congestive. In the first form, the nervous power is evidently and materially impaired; in the latter it is evidently increased. In the first, the circulation is feeble; in the latter, it is even stronger than natural. In the one disease we have the energies, as it were, at once overwhelmed, and the system yielding without an effort; —while in the other, even although the morbid action is ultimately to prevail, we have the system for a time struggling manfully against it. In a word, in the one disease we have inflammation and in the other congestion, two states of the system which, although frequently running into each other, are nevertheless, when apart, so widely different as to present us with a set of symptoms peculiar to each, and, consequently, to call upon us for remedial agents of very different characters.

Whatever, indeed, may be the nature of marsh-poison, and in whatever way, or ways, it is received into the system, the effect which it ultimately produces on the human body appears to be *directly sedative.* Its prominent effects are subduction of nervous power, diminution of vascular action, and remarkable prostration of all the energies. Nor do these sedative effects appear only at the commencement of the disease, but they characterize it through its whole progress; and, indeed, unless we can by our remedial agents set up reaction, it will, in all probability, never be set up at all.

There are also the best grounds for thinking that the fever, which occasionally occurs on board ships, and which, as has formerly been observed, is supposed to be induced by ligneous decomposition, is as nearly as possible of the same nature as that induced by marsh exhalation; namely, fever of a low kind, wherein all the energies are depressed, in a remarkable degree, even from its commencement. The exhalation from the wood, like the exhalation from the marsh, appears to exert its influence at once on the excitability, destroying or impairing it, and so producing that state of feebleness, stupor or collapse, which we are in the habit of terming debility, congestion, &c. &c. At least we find Dr Wilson of the Royal Navy, the individual who first called attention to this very important subject, and who has given us an interesting account of its progress while prevailing in H. M. S. Rattlesnake, detailing a number of cases wherein the symptoms were strictly congestive. To him, indeed, we are indebted not only for the promulgation of original views regarding the *cause* of West India fever, but for a clear exposition of the two very different states, under which tropical fever may present itself; and I apprehend that many who, prior to the appearance of his essays, were in the habit of treating the disease almost exclusively by blood-letting and other powerful antiphlogistics, have seen the propriety of materially remodelling their practice.*

And yet, although we are nearly quite certain that tropical fever, when produced by marsh exhalation, or by ligneous decomposition, is, in by far the greater number of cases, an asthenic disease, we are as well aware that in many instances it is the reverse,—an inflammatory one. Age, habit of body, and numerous other circumstances with which we are perhaps unacquainted, may so interfere with the action of the poison as to give to the fever which it produces, a character altogether different from that which it usually presents, just as a peculiar habit, or a peculiar idiosyncrasy, will sometimes enable the individual to resist the reception, or at least the deleterious action, of it altogether. Three men, for example, of the same age, and apparently of the same strength, &c. &c., will present themselves at the same time, with fever induced by the same cause, and yet in each the aspect of the disease shall be different. One will have a disease which we may well term inflammatory, and treat accordingly; the second will have a fever possessing characters as distinctly typhoid or congestive; while the morbid action in the third will not be exactly like either, but in some measure partaking of the nature of both. In fact, the disease may be almost as varied as the subjects upon which it shows itself. And what an error is it, then, to imagine, as many have done, that when fever is prevailing, whether at sea or on shore, it is always to be recognized under some peculiar form, and combated by some peculiar remedial process? Instead of taking the individual cases as they come, and treating them according to their varied aspects, they proceed at once to enrol a set of symptoms which they deem applicable to *all*, and forthwith attach to their symptomatology a suitable mode of treatment,—and what is the consequence? why, that although many, nay, perhaps the majority, may be treated properly enough, others are unfairly dealt with; and so, in addition to a more extended mortality, we are apt to have our confidence in some of the best remedies materially shaken, merely from misapplication. The days, however, of treating disease *en masse* are passing rapidly away.

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* It is proper to observe, that Mr Wallace labours under a mistake in ascribing to Dr Wilson the distinction of tropical or miasmatic fever into the inflammatory, synochal or irritative, and the congestive or typhoid forms of the disease. That distinction, and the corresponding modification of treatment, were made long previously by Dr Jackson, who has taken particular pains to explain it at considerable length, and with as much clearness as the subject admits, in his subsequent writings.

The peculiar originality of Dr Wilson consists, as we have already shown in volume xxix. p. 189, in explaining more fully than had yet been done, and confirming, by a more copious and extensive induction of facts, the influence of ligneous decomposition in inducing fever.

Even in this particular, however, Dr Wilson is not altogether original; nor does he seem to think himself original. The doctrine of the decomposition of wood and woody materials giving rise to fever, was more or less clearly taught by several of the physicians of New York, and is more especially represented as a cause of fever by Dr Caldwell. Baron Von Humboldt afterwards invested the doctrine with greater importance, by directing attention to the impenetrable forests of mangroves and avicennias (*Rhizophora Mangle, Avicennia nitida*) (*Conocarpus Racemosa, Gomphrena Flava,*) with which the sea coasts and the river banks in the tropics are surrounded, and ascribed to the rapid alternate growth and decay which the plants of this family undergo, the power which the surrounding atmosphere possesses in inducing fever in the persons of Europeans. (Personal Narrative, Vol. iii. p. 190 & 392.)

With regard to the method of treatment, if Mr Wallace turn to Dr Jackson's Sketch of the History and Cure of Febrile Diseases, (Stockton, 1817,) and his account of the Gibraltar Epidemic, he will find the treatment modified according to the kind and variety of the disease.—EDITOR.

The varied aspect which tropical fever presents is perhaps nowhere better illustrated than in the book formerly alluded to, published by Dr Wilson. In it we have many instructive cases given, by which the narrator not only clearly establishes two very distinct forms of the disease the inflammatory and congestive; but he further shows that of each of these there were again various degrees; so that no one case was perhaps exactly like another, and, consequently, no one case but demanded the most minute attention, and the most careful adaptation of remedies.

It is our belief, then, in conclusion, that fever when occurring from marsh exhalation, is, generally speaking, an asthenic disease; that when arising from mere excess of solar heat it is as generally sthenic; that when arising from ligneous decomposition in ships, &c. its characters are nearly the same as when arising from marsh exhalation; that, nevertheless, it obeys no fixed law, but may present, even when arising from merely one source, a variety of aspects; and that, consequently, in the application of remedial agents, the closest examination of symptoms must continually be necessary.

The opinions which have just been expressed as to the nature of miasmatic fever, will probably point at once to the method of cure we would recommend. As a general rule, we would say that blood-letting, at least general blood-letting, is inadmissible, but to this rule, as has already been hinted at, there may be many exceptions. If the patient, when he presents himself, is decidedly labouring under inflammatory disease, if the arteries are beating strongly, with the skin parched and burning, the headach acute, and all, or the chief of those symptoms present which constitute synochal fever, then there cannot be a doubt as to the propriety of having immediate recourse to general blood-letting. There is, indeed, no other remedy to which we can look, in such cases, for any thing like immediate and decided advantage, and, therefore, is it indispensably necessary not only to have recourse to it early, but to carry it to the requisite extent. It will not do to measure the quantity of blood, or to settle before hand the number of ounces we may with propriety take away. But we are to look to the disease, and to the strength of the patient, and so long as the latter will bear further reduction, and the former is evidently continuing its course, so long will it be necessary for us to proceed with the remedy. We will at the same time purge briskly, administer nauseating medicines, bleed locally, if necessary, and do all that experience has taught to be efficacious in the treatment of synochal fever.

But supposing the fever to have a somewhat different character; supposing the pulse, although tolerably full, to be easily compressed, the heat of surface not greatly above par, the headach accompanied with a slight degree of stupor, and that degree of anxiety present which indicates as much of nervous as of vascular derangement; then, although blood-letting may still be admissible, nay, perhaps indispensable, still, this is a case in which these two very important questions require to be well weighed. 1*st*, Whether general blood-letting ought to be had recourse to at all? and 2*dly*, To what extent it ought to be carried? And, again, if the disease have still a different character, if the strength of the artery, instead of being increased, is diminished, the surface cold and slightly clammy, the patient nearly heedless of what is passing around him, and all the energies, mental and corporeal, depressed in an extraordinary degree; then, if blood-letting is not altogether proscribed, it will, at least, be but seldom admissible; and, indeed, nature herself, by obstinately refusing to yield the blood, will, in the generality of such cases, at once point out the impropriety of the practice, and effectually prevent its being carried into effect.

What, then, is to be done in those cases of miasmatic fever where blood-letting is proscribed? Let the patient be put to bed, and covered well with bed-clothes, so that the natural and equable heat of the body may be restored as soon as possible. If a bath at from 90° to 98° (Fahrt.) can be obtained, the patient may with advantage be placed in it for ten or twelve minutes, then rubbed, and put into bed; and in those cases where the requisite quantity of warm water cannot be procured, bottles filled with this fluid and placed along the extremities, at the *scrobiculis cordis*, &c. will prove a valuable substitute. As soon as the patient has been placed in bed, an active cathartic should be exhibited, following it by others, and adding, if necessary, powerful *enemata*, until the bowels have been freely opened. In those cases where the stomach threatens to be irritable, calomel, croton oil, gamboge, elaterium, &c., from the small quantities in which they are administered, will be the most suitable purgatives. It is a well known circumstance, that in this disease, the bowels are often obstinate in a remarkable degree, requiring not only the aid of the most powerful cathartics, but a steady perseverance in the use of them, ere their perfect solution can be obtained. Nor is it enough merely to unload them of their feculent contents; we must proceed until the secretions are healthy, until at least there is an approach to the evacuation of healthy bile; always remembering, however, that purgation, like other remedies, may be abused, or may be carried farther than the strength will bear, or the disease demands.

But the grand remedy is the introduction of mercury into the system, so as to produce ptyalism, or at least to render the gums swollen and tender. This is a remedy about the propriety of using which there have been many opinions; some upholding it to be almost a perfect antidote, others representing it as being nearly altogether inefficacious, while a third party have condemned it as positively injurious. This, of course, is no place to discuss these questions. It is enough to state our conviction, that in the disease under consideration mercury is a remedy possessing sovereign power, and one, therefore, in all cases deserving a trial. It is true that we may sometimes fail in our attempts to introduce it into the system; and it is as true that, occasionally, even when it is introduced, all the good does not result from it which we anticipated. But so *generally* can we introduce it, and so *seldom* does it disappoint us in its effects, that we look to it with more confidence than to any, nay, than to all put together, of the other remedies we are in the habit of employing along with it.

From the very onset of the disease, therefore, our efforts should be directed towards mercurialising the system. Calomel ought to be given, combined with opium, or with camphor, if deemed necessary, in such doses, and at such intervals, as shall afford it the greatest chance of being received early into the system; while, if the case is at all urgent, strong mercurial ointment should be rubbed assiduously on the surface. Nor are we to give up the practice merely because it does not immediately succeed. We are strenuously to persevere so long as there is the least hope left, for our object may be attained even at a late period; and, once get the mercurial irritation set up, and, with a very few exceptions, the febrile action ceases. Let the patient's mouth be once decidedly sore, and the chances are that he is safe, at least for a time.

To pursue, however, to the utmost the advantage which we gain by the introduction of mercury into the system, it is necessary to have recourse to another medicine, quinine. If we imagine that the patient is safe because we have managed to set up the mercurial action, we may be mistaken, for it is known almost to every one, that there is a remarkable tendency in the disease to return immediately after the power which is controlling it ceases to operate. It is, therefore, necessary to second the operation of mercury by some other febrifuge power, and, amid all the remedies of this kind which have yet been tried, perhaps quinine is the most efficient. Whether it acts merely by giving tone to the system, or whether it possesses some more direct antifebrile quality, it is unnecessary here to enquire. It is sufficient to know that in this disease, as well as in many others, if an intermission, or even a remission can be procured, so as to give time for its application, such a change may be induced as shall destroy completely the morbid tendency which exists, and so bring the patient from a state of uncertainty and danger into one of secure convalescence. It ought, therefore, to be given immediately the action of the mercury is evinced, and even at an earlier period than that, should the bowels have been freely opened, and the symptoms appear to demand it. In conclusion, we would observe, that had somewhat more attention been given to the proper adaptation of the two remedies, mercury and quinine; some of the obloquy, which has occasionally been heaped upon both, would in all probability have been spared.

These, then, are the three great remedies upon which we would rest our hopes of success in the treatment of miasmatic fever, namely, purgation, the introduction of mercury into the system, and the administration of quinine. That they will sometimes fail to achieve all that is desired of them, nay, that they may frequently be put in use, even to the utmost extent, without producing any remedial effect, is what few, who are disposed to speak candidly on the matter, will deny; but where are we to seek for a universal elixir, where for a never-failing antidote? Of course, many other remedies in addition to those now mentioned, will frequently be absolutely necessary in the treatment of the disease in question. But these I pass over, as my object is merely to glance at some of the prominent and essential points connected with the subject.

With regard to the treatment of that form of tropical fever which has not been induced by exposure to malaria, as it in almost every case assumes the inflammatory character, blood-letting, purgative medicines, the administration of antimonials, and all those other depletory and sedative measures which we are in the habit of employing in sthenic disease, will be efficacious here. It is, fortunately, a disease much more under our control than that which we have previously been discussing. If taken in time, and treated actively, there will, in general, be but little danger. Nevertheless, cases are continually occurring wherein the symptoms are so violent as to excite very considerable alarm; and in such cases one great resource, as in the congestive form of the disease, is mercury. As soon as the mind is made up as to the dangerous character of the ailment, we ought to combine with our other curative measures the unremitting exhibition of mercury, continuing it either until the mouth has become sore, or until we have convinced ourselves that such an effect cannot be obtained; for upon this point, the reception of the mercury into the system, we think the fate of the patient will often exclusively depend. It is possible that by some a degree of scepticism may be entertained as to the efficacy of the remedy in both forms of the disease; but he who gives the matter any reflection will at once perceive that even in theory the position is quite tenable; and if we find that practice confirms the theory, which it certainly does, surely there must be an end of scepticism. As to the administration of the quinine here, it can only be administered when the disease has been protracted, and the strength has been in a considerable degree impaired; or when, in its latter stages, it assumes the remittent or intermittent type, which, indeed, it will frequently do.

Before concluding these few remarks on the treatment of tropical fever, it is necessary to observe, that in robust young subjects (in soldiers or seamen for example) newly arrived from a temperate climate, miasmatic fever will often, indeed, very generally, be a mixed disease; that is, there will be sufficient excitement present, especially at its onset, to warrant the employment of depletion to a certain extent, while, at the same time, there will be so much evidence of a typhoid tendency existing, as will intimate to us at once the necessity for caution in all the depletory measures we employ. It is in such cases, indeed, that the skill of the practitioner is best shown. The accurate observer will be able to detect almost at a glance, the method of cure required; while he who has had less experience, or who has not profited by his experience, will be for a time in doubt, and will probably mismanage his patient after all.

From what has been said in the early part of these observations, the principles upon which we ought to proceed in our attempts to prevent the disease under consideration, must be evident. One essential point is, to preserve in as far as we can the natural energy of the system, which is best done by giving to the body regular sleep, adequate exercise, and a moderately nourishing diet; and to the mind that degree of recreation and employment which will keep away from it every thing like idleness and ennui. Another, and a more essential point still, is to protect ourselves from the influence of the atmosphere, or at least to breathe it in an altered or diluted state. For this purpose, if we reside on shore, the houses in which we live ought to be built in such a way, and of such materials, as shall expose us the least; fires ought to be kept burning in the various apartments occupied; during the night the windows of the rooms in which we sleep ought to be closed; if possible we ought to be within doors by sunset; and in those cases where we must be absent until a later hour, by walking about, or by otherwise keeping the body in a state of activity, the chance of its being impressed by malaria will be very considerably diminished. Finally, and above all, we must not sleep while in the midst of the febrific poison; for, as we have already said, to do so is almost certain destruction. To smoke, to use cigars, for example, in swampy situations, and especially during the night, we believe may be frequently advantageous.

In those cases, however, where we have to take up our residence for a time in a situation, or in a country, with which we are altogether unacquainted—as will frequently happen to travellers, to troops on the march, &c. &c., perhaps the points most deserving of attention are the following. If the party is in the neighbourhood of the sea shore, if it is a rocky coast, if the ground upon which they actually encamp is without swamp or vegetation, and the prevailing winds are *from* seaward, in such a situation they may be almost pronounced safe; for in all probability there is nothing in their immediate vicinity which can give out miasmata, and the noxious influences of the interior, if such there be, from the state of the winds, are not likely to reach them. If, however, they are inland, and are in doubt as to the nature of the surrounding country, then the two great points to be attended to are; 1*st*, to keep as clear as possible of all wood, jungles, or swamp, that may be in view, and *2dly*, to have a barrier of some kind, as a piece of rising ground, between them and the quarter whence the wind blows. If they could be certain that no deleterious influences lay to windward, then the highest elevation they could get, if free from wood, would probably be the best; but, in a state of uncertainty on this point, it is always best to take for granted that the breeze, as it travels from the interior, is conveying along with it unhealthy vapours, and that, consequently, the more we protect ourselves from it the better. That part of the ground where the tents are to be pitched, where the people are to sleep, ought especially to be attended to. On the portion of earth which the tent is to cover, a piece of strong tarred or painted canvass should be spread, so that no dampness whatever may reach the bodies of those who sleep; and if between this canvass and the ground a layer of small pebbles can be laid so much the better. Each person should be made to sleep in a thick flannel dress, and he ought to wear the same covering if he is obliged to be out at night,—if he is on guard for example; and as a further protection, in those cases where the vapours are decidedly unhealthy, the flannel covering should extend over the face, with the aperture through which air is received so placed as to be in some measure removed from the mouth; for thus the raw atmosphere, instead of getting directly to the lungs, has to reach them in a circuitous manner, a circumstance which we think may be of some consequence. If the nights are raw, a lamp or fire may be kindled either in, or at the entrance of the tent; the entrance of the tent should be invariably to leeward.

The rules for the prevention of fever on board ships are of course nearly the same as those now noticed. If the vessel be on a windward coast, and the soil is such as to give out pestilent miasmata, she should avoid, in as far as she can, any close approximation to the shore; while, if the reverse be the case, if the land be on the lee, she may navigate pretty safely at no very great distance from it. But as she must occasionally go into harbour, and will frequently, probably from the nature of the service upon which she is employed, have to run closer to the land than is altogether safe, at such period, in addition to the awnings usually spread, curtains should depend, of sufficient density and extent, to interrupt and throw aside the breeze as it reaches the vessel. She ought especially to be protected forward, or at the bow; for, as a general rule, when a vessel is at anchor, she rides "head to wind," or with her bow to the breeze, so that all vapours floating towards her reach that situation first, and, consequently, if interrupted, there will pass no farther. The ports should be closed during the night, and, if possible, the men should be persuaded to sleep on the main or lower deck, taking care that they are sufficiently clothed before lying down, &c. &c. Of course the stay of the vessel in harbour should be no longer than the exigencies of service require; and while she does remain, her crew, except in so far as duty may carry them on shore, or detach them on other service, ought to be kept constantly on board. It is customary, when circumstances permit, to give seamen permission, "liberty," as it is called, to enjoy themselves occasionally on land; but in a harbour where fever is to be dreaded such an indulgence could only lead to the most disastrous effects, and ought, therefore, in no case to be granted. The system, too, of sending boats on shore, perhaps at a late hour of the night, to await the arrival of officers, is a bad one, and ought to be avoided. When boats are employed on this duty they ought never to be detained; that is, the officers should be ready to leave as soon as the boat arrives. But perhaps the less that either officers or men have to do with the shore, in such climates, after sunset, the better. If, in spite of all the precautions that may be taken, fever should appear, the vessel should proceed to sea with all possible dispatch.

But it frequently happens that the nature of the service, upon which the ship is employed, obliges her to detach boats in various directions, sometimes up rivers to a very considerable extent, for the purpose of surveying, in search of slave vessels, &c. &c. and in such cases all that can be done for the safety of the crews should be most rigorously attended to. Everything, indeed, will depend on the activity and intelligence of the officers in command; for, unless they are on the alert, the men will most certainly commit many irregularities, and unless they are in some measure acquainted with the means which ought to be adopted for the preservation of health in such situations, they will themselves be very apt to fall into error. Officers, therefore, sent on such expeditions should have certain instructions as to the system upon which they are to proceed, and care should be taken that they are liberally supplied with all that may be necessary for carrying the system into effect. Awnings, curtains, tarpaulins, blanket or flannel dresses, the means of erecting suitable tents, of kindling adequate fires, of preparing nourishing food, &c. &c. will be required; in short, all the rules at which I have already hinted, for the preservation of health either at sea or on shore, will be applicable to boat service. But too often, even with the best care, dangerous disease after a time makes its appearance; and when this happens, if the service can at all be abandoned, the boats should immediately return to the vessel.

Supposing, however, the boating expedition to be finished, and the crews have returned to the ship apparently in good health, but that shortly after their return fever appears in one or two, leading us to suppose that the poison, although still inactive in many, has been received by all, and that, consequently, many are likely to suffer from it, is there any method by which we can so act on this poison as to destroy its power, or at least render it in some measure less violent? I am of opinion that this is to be accomplished by mercury. By introducing mercury into the system ere the febrile action is established, although we may not succeed in warding it off altogether, we may at least so protract its appearance, and so modify its character, as to render it a disease of a much less dangerous kind. This I have seen happen in more instances than one; and indeed so satisfied am I of the benefit to be derived from the practice proposed, that I would never fail to have recourse to it on all suitable occasions.

Whether bark (quinine) has the property of fortifying the system, so as to enable it to resist the febrific influence, is a question which we rather think the majority are inclined to decide in the negative. Still, as there is a doubt about the matter, and as we know, at least, that it possesses very striking powers as a remedy *subsequently* to febrile disease, we think that the practice of administering it to men in unhealthy situations is at all events deserving of trial. It ought, however, to be merely looked on as an adjuvant; we should not for a moment suppose that it alone is to be relied on, or that it can at any time supersede the employment of other and perhaps more efficient remedies.

As to the question which has so often been considered, "whether the frequent washing of a ship's decks, especially her lower decks, gives her an unusual liability to fever?" it appears to us that the only way in which such an operation can facilitate the appearance of febrile action is by expediting that decomposition or change in the woody structure which, as has already been remarked, is supposed to be an occasional cause of fever on board ships in tropical climates. That the washing of the decks may hasten this process of decomposition is probable, but, after all, it is more a matter of conjecture than of fact; and, upon the whole, I am of opinion that more importance has been attached to damp decks, and that greater apprehension has been entertained regarding them, than circumstances appear to justify. That catarrhal disease, &c. &c., may frequently result from them is likely; but that they have ever given rise to any thing like general fever, is extremely problematical.

The only way in which we can hope to prevent, or at least retard, the woody decomposition of ships, is to remove them at stated periods from the tropical into colder latitudes. Unfortunately the precise period at which this change in the woody mass is most apt to take place, or the degree of heat necessary to call into existence, &c. &c., have not hitherto been ascertained; but the principle upon which we ought to proceed is at least obvious; and, at all events, the moment such a change does appear, the antidote should be applied without delay.

Having made these few observations on some of the principal points connected with the subject, we now proceed to remark, shortly, on some opinions which have lately been advanced by Captain Owen, R. N., an officer who has served long and arduously on the most dangerous coasts, and whose notions regarding the production of fever are likely to influence in a considerable degree those who fall in with his interesting Narrative.

In February 1822, H. M. ships Leven and Baracouta sailed from England on a surveying expedition to the east coast of Africa, &c. &c., and after touching at Lisbon, Madeira, Rio Janeiro, and other places, arrived at Delagoa Bay, the former in September, and the latter in October of the same year. The Leven anchored in English River, one of the rivers discharging itself into the Bay; and on the 3d October some of the boats, with a party of officers and men, were sent up this river for the purpose of exploring it, and others which appear to be tributary to it. This appears to have been the first boat exploring expedition, (at least as regards the Leven,) and up to this period we had nothing of sickness in either vessels. On the 12th, that is, after an absence of nine days, the boats returned, and on the 24th Mr Tambs, midshipman, and another of the party died of fever. On the 30th, a seaman died of the same disease; and early in November Captain Lechemere, after lingering some time, also expired. On the 14th October, two days after the return of the party from English River, another, consisting of one lieutenant, three midshipmen, and twelve seamen, were sent to explore the Dundas River; and although it is not stated how long they were absent on this service, or the exact number taken ill after their return, yet we are pretty sure that the number was not small, as we are told immediately after "that the cases of fever on board now amounted to upwards of twenty, &c. &c." On the 5th November, six officers with twenty-four seamen and marines, under the command of Captain Cutfield, were sent to examine the Manice River, on which employment they were absent fourteen days; and on the 24th, that is, five days after their return, "the Baracouta telegraphed" to the Leven, "that her Captain, (Captain Cutfield,) four officers, and eighteen men were taken ill;" no doubt those officers and men who had been employed in the expedition. On the 29th, we learn that Captain Cutfield died, but the deaths amongst the others are not stated.

The next expedition took place a considerable time after, in the Cockburn (a tender attached to the vessels) up the Mafoota River; and this expedition appears also to have ended in the destruction of the majority who were engaged in it; for immediately after its accomplishment we have it stated, "that frightful was the list of those who had fallen beneath the deadly curse of Africa, amounting to *two-thirds* of the officers, and *half* of the crews of the three vessels, &c. &c." Further on, we find that, in an expedition from Quilimane to Senna, the whole three officers engaged in it—namely, Lieutenant Browne, Mr Forbes, botanist, and Mr Kilpatrick, assistant-surgeon—perished by fever after a very short period. Lieutenant Reitz in a journey between Mombas and the falls upon the river Pangany, also died. In 1825, when the vessels were on the west coast of Africa, on their return home, Messrs Bullen, Hutcheson, and others died from exposure up the Kittam; and, lastly, Mr Tudor fell a sacrifice to his labours in the Gambia.

These are important facts as regards the boat expeditions. But there are still one or two other circumstances, perhaps of not less importance, to be noticed relative to the true source of this very deadly disease. Soon after the arrival of the vessels at Delagoa Bay, they established an observatory on shore, at the entrance of English River, and stationed one officer (Lieutenant Gibbons) there in particular, while others resided there occasionally. On the 28th November, this Lieutenant Gibbons died; and although it has already been stated that Captain Lechemere died soon after his return from the English River expedition; yet, as this gentleman was also an occasional inmate of the observatory, there may be a doubt as to whether he contracted his fatal disease in the former or latter of these situations—but certainly in one of them. The carpenter and kaulker having been left for some little time on shore, in a house somewhere near the observatory, for the purpose of repairing boats that were defective, were also in a very short time seized with fever, which proved fatal to both. And in 1825, on the return of the vessels to Delagoa Bay from the Mauritius, Lieutenant Nash, and Mr Farley, purser, both died—the former from having been engaged in a hippopotamus hunt, and the latter from having slept two nights on shore. Other cases of the same kind might perhaps be cited, but they are unnecessary.

In fact, from the beginning to the end of this surveying expedition, we have the most satisfactory evidence that neither the officers nor men became sickly from being in the ships, but from being up the rivers in boats, or stationed somewhere on shore.

It is clearly established that, up to the 3d of October, there were no cases of fever in either vessel, but that with the return of the first river party on the 12th, fever appeared, and went on increasing, just in proportion as the boats were detached, and the men were exposed on shore, until, as we have seen, two-thirds of the officers and one-half of the crews of the three vessels had perished by it. Could there, indeed, be any doubt about the matter, the explicit declaration of Captain Owen himself would at once set it at rest. He says, " that amongst all the men ill of fever on board, *there was not one who had not been employed away from the ship; they were either boats' crews who had been up the rivers, or those who at different times had resided at the observatory ;*" clearly proving that, in order to receive the febrific poison, it was necessary to proceed to the shore—that to remain in the ship was to be out of the reach of danger. That fever might ultimately independently of boating-expeditions or actual communication with the shore, have appeared in the vessels, especially if they were anchored close to the land, &c. &c. we do not doubt; but that no such event had *then* taken place—that the miasmata were *at that time* inactive so far as regarded the ships, is not only fully proven by the general narration of the facts, but by the express declaration of the narrator himself.

And yet, strange to say, Captain Owen, with all these facts before him, stubborn as they are, appears to attribute the spread of fever amongst his crews, and the mortality which followed, much more to " fear" or apprehension than to any other cause; indeed, so continually is he insisting on this point, and so much importance does he attach to it, that, apparently, he sets other influences nearly altogether aside. This we certainly think most extraordinary, and can only explain it by the well-known circumstance, that even the most intelligent of men, once having wedded themselves to an erroneous opinion, will sometimes fail to see its incorrectness even when such has become evident to every one else. From the adventurers themselves we learn that in their passage up the rivers they were surrounded by " low muddy land, by swamps and stagnant pools, by mangrove bushes,"—in short, by all that can give out deleterious miasmata; and surely the natural inference is, that if fever occurred after such an exposure, if it was not wholly to be attributed to their influences, it was at least to be attributed to them in a most material degree. And, as to this " fear" which is so much insisted on, we cannot conceive how it could affect so generally, or unman so completely the stout hearts of the explorers; a few might get afraid, but surely all would not lose heart. But even admitting its existence to the fullest extent, and admitting it to be the destructive agent which it is held to be, as it could only come into operation after a certain number of fatal cases had occurred,—after the deadly nature of the disease had been discovered—there must of course have been some anterior cause—some other agent to begin what "fear" was to carry on and finish.

The cases, too, brought forward in support of the opinion do not confirm it. It is intimated that Captain Cutfield became grave and desponding immediately after the death of his friend Captain Lechemere, and that out of this despondency arose his fever, &c. &c. But, as we have already seen, Captain Cutfield had been up the Manice river immediately before; and as a great many, both of the officers and men, who accompanied him on that expedition, were taken ill and died soon after their return, surely it is but fair to conclude that his disease was contracted at the same source. The case of the gun-room steward of the Leven is also extremely defective. That this man was exceedingly depressed in spirits there can be no doubt, and that his despondency might be increased by what occurred at the funeral of his shipmate is also likely; but the very circumstance of his being on shore at that funeral, while it proves that he was at least *once* exposed to the noxious influences of the land, gives us the best reason to think that his fever had also a miasmatic origin. As to Captain Lechemere's servant, who grieved so exceedingly for the death of his master, and went to bed predicting he would die at a certain time, the statement will not bear comment. We cannot indeed find that this man had a single symptom of fever. All we learn is, that after being for three or four days under the influence of some inebriating liquor, he then became sober.

In short, we are quite satisfied that the position which Captain Owen here takes up is altogether untenable. Did he merely maintain that fear gave a predisposition to the disease—that by weakening the general energies, it allowed the system to be more easily acted on by the exciting cause—he would then to a certain extent be right; but to convert it into the grand and, indeed, the sole agent of destruction—is altogether out of the question. When he himself tells us, that "death's cold grasp was seizing upon the strong, the healthy, and the young," there surely must have been something more than "fear" in operation. If apprehension had any thing to do with the matter at all, it must have been little. We think, at least, that the "muddy flats covered with mangrove trees, the swamps and stagnant pools, &c. &c." had infinitely more;—and this opinion is surely confirmed by the circumstance, that in that very expedition up the Dundas and Mattol rivers, which Captain Owen headed himself, with the express view of inspiriting his depressed crews, those who were exposed to the malignant influences around them suffered sickness and death, just as others had done before them, in spite of all the animation that could be instilled into them by their daring and indefatigable commander.

To illustrate the matter a little farther, however; about the end of November we are told that "the mortality now became dreadful in the Leven and Baracouta; but, strange to say, the Cockburn had escaped without one case." This may indeed appear a little strange at first, but the least inquiry into the matter makes the strangeness at once disappear. The Cockburn, prior to this, had never been employed on any service which exposed her people to the same influences to which the crews of the other vessels had been exposed; for although she had ascended the Dundas to a certain extent, yet her people were not in boats, but in the vessel, a circumstance of immense importance as regards exposure, &c. &c. It is true that during this expedition both the officers and men made occasional excursions inland; but these always took place during the day; we find them returning regularly in the evening to the vessel; and although upon one occasion the boat in which they were returning "grounded on a mud flat," and thus detained them for a considerable part of the night in a most unhealthy situation, yet as no one slept, or even remained for a moment at rest, from the fear of being attacked by hippopotami, &c. &c. consequently the chance of suffering from such an exposure was greatly diminished. Besides, the whole time occupied by the expedition appears to have been exceedingly short—not more than two or three days. In her subsequent expedition up the Mafoota, (formerly noticed,) when her men were not only exposed much, but for a long period, there was scarcely one on board who was not taken ill, and many both of her officers and men died. In a word, the men on board the Cockburn only required to be placed in the requisite situation, and then fever attacked them just in the same proportion, and with the same fatal effects, as happened to the crews of the other vessels.

As regards the treatment of the disease, as well as its cause, I think Captain Owen has expressed most erroneous opinions. He is a decided enemy to blood-letting, to mercury, and indeed to all other measures which English surgeons are in the habit of occasionally employing in their combat with this deadly foe. If he has faith in any plan of treatment at all, it is in the native plan, of which he gives a specimen or two; but even to that he does not appear to be altogether a convert, and, upon the whole, he declares his belief, that a man is safer by trusting to his "own experience and constitution" than by placing himself in the hands of any doctor whatever.

Now, in a former part of this paper, it has been shown, that we ourselves are by no means over sanguine as to the efficacy of the measures which we are in the habit of employing against the disease in question; and the admission has also been made, that some, nay, perhaps many, may have been destroyed by the application of injudicious remedies, or at least by remedies injudiciously applied. We are perfectly aware of the sometimes uncontrollable nature of the disease, and we would not flatter either ourselves or others, that when once it has taken root—when once it is proceeding on its destroying career—we are in possession of any thing which can actually be called an antidote. But while we admit this, we must also state our conviction that there are remedies which, in judicious hands, will often prove advantageous—that there have been cases, many of them, cured by these remedies—and that, consequently, any man who would refuse to have recourse to them, when labouring under dangerous disease, might well be charged with undue obstinacy, and might, indeed, be accessary to his own death. That the healing art is not altogether to be depended on, is true, and that mistakes will frequently be made in the prosecution of it is as true; but surely these can never be assigned as reasons for its utter condemnation. If the amount of good accruing from it can be proved to be greater than the amount of evil, there is at least a chance in favour of him who seeks its aid; and that such is the case—that medical science is really beneficial to mankind—the belief and the practice of all ages and of all nations give most ample and convincing testimony.

But—to go a little more minutely into the matter—Captain Owen observes, that "blood-letting ought always to be avoided when the fever has actually taken possession of the frame," for that then "it is, if possible, even more deadly than the disease itself." Now, it would be well to know how he arrived at this conclusion. Did he take a certain number of fever patients and bleed them, and did he take a like number and refrain from bleeding them, and did he find that the deaths were more numerous amongst the former than the latter? Because if he did not try some experiment of this kind, or see it fairly tried by others, we apprehend he is but ill qualified to give judgment in the question. If he saw blood-letting used injudiciously—if he saw it had recourse to in an improper form, or at an improper period of the disease—or if he saw it carried to an injudicious extent, &c., &c. then, indeed, there would be good reason for the malediction he has pronounced upon it. But surely he does not mean to say, that when a strong man comes before us with a bounding pulse, a burning skin, the face flushed, and other symptoms indicative of high excitement, we are not to bleed him. If we are not, then all that we have been taught is erroneous, and all our experience must go for nothing. It is true, that, after all, the remedy may not destroy the disease—the patient may die, and die quickly too, under the treatment. But we do say that, by bleeding him, we give him the best chance—that, in nine instances out of ten, we will at any rate give immense relief for the time—and that, in many cases, we will so subdue or retard the violent symptoms as ultimately to bring about a recovery. The case of Mr Conolly, assistant-surgeon, who is said to have died on the third day, after having bled himself profusely, is no case against blood-letting at all. This unfortunate young man, at the time of his illness and death, was alone, that is, he was out of the reach of his medical friends; and whether he treated himself improperly or not, who is it that can tell; who is it that will venture to say that relief was not afforded by the blood-letting which has been condemned, or that recovery would have taken place under any circumstances whatever? We would, however, again observe, that, as a general rule, we are ourselves opposed to the practice of blood-letting in this disease; but that, like all other rules of the same kind, it is one to which exceptions will be occasionally occurring.

Upon mercury, too, or rather upon one preparation of it (calomel) he passes the same sweeping condemnation. He says that it also "ought always to be avoided when the fever has actually taken possession of the frame," &c. Now, although as regarded blood-letting, I am to a certain extent on his side, here I must be most completely opposed to him. I maintain that there is scarcely a case of tropical fever, let it be of what sort it may, in which this remedy (mercury) may not be used with the most perfect safety, and frequently with the most decided advantage. The great evil is, that, in a great number of cases, the system will not receive it; it produces, in fact, no perceptible effect; and, therefore, how Captain Owen could have ascertained that it is a poison of such a "deadly" sort, is somewhat inexplicable. In those happy cases where it does influence the general system, the patient, so far from being poisoned, is positively cured; his fever ceases at least for the time, and the chances are greatly in his favour, if he is managed well, that from that time forward he will convalesce. We know that cases have occurred in which excessive debility, protracted convalescence, and even death have ensued from the over-liberal administration of mercury. But this is no argument against the general practice. Extraordinary cases can never be put in the scale against those of every-day occurrence; and I am quite sure that he who understands what tropical fever is, and has seen the benefit which occasionally results from mercurial influence in that terrible disease, will never be deterred from its use, by the mere dread of its proving prejudicial in some rare instance.

But although he interdicts mercury during the progress of the fever, he, nevertheless, thinks that it may be productive of good effects as a "restorative" after the disease has been removed; but what he means by this I do not exactly understand. I should think the recommendation a better one if it were to give the medicine *before* instead of after the appearance of the febrile action. Blood-letting, on the other hand, he thinks, may occasionally be advantageous *before* the onset of the malady; and how far he is right in this I do not pretend to say. But, altogether, it is my belief, that the advice which he proffers regarding the treatment of the disease is no less erroneous than the opinions he entertains regarding its cause, and, consequently, that, in condemning the one, we must of necessity condemn the other also.

These are perhaps the principal medical fallacies which exist in Captain Owen's book; and they have been noticed with the view of correcting, in as far as possible, errors which must necessarily be disseminated widely, and act in a proportionate degree injuriously. If the opinion were once received, that so long as men are not afraid, they may safely expose themselves in unhealthy situations, or, in other words, that marsh miasmata may generally be braved by a bold heart, the calamities resulting therefrom would be excessive. Neither does it appear advisable, that men should labour under the impression, that, when attacked with this deadly disease, they are altogether beyond the reach of help—that medicine can do nothing, nay, less than nothing for them. But although at issue with the author on these points, we cannot take leave of him without saying, that we respect him for his knowledge, his industry, his perseverance, and the numerous perils through which he passed. We feel how deeply we are indebted to him, and to those associates who sojourned with him on these inhospitable shores, for the good which has been achieved through their industry; and we trust that he and all who have survived with him will long live to enjoy the homage and the honours which their long-continued and harassing labours have earned for them.

H. M. S. Trinculo, July 1834.

ART. III.—*Observations on the deleterious effects occasionally produced by Pork; contained in a Letter to Professor Christison.* By JOHN M'DIVITT, M. D., Physician to the Kent and Canterbury Hospital. [Communicated by Dr CHRISTISON.]

IT is well known that certain species of fish, and shell-fish occasionally, prove poisonous to those who eat them, even when it is impossible to detect any change in their sensible properties.

On the continent, particularly in Germany, the same thing has been found to happen with respect also to sausages, bacon, cheese, and even milk. Several physicians have believed that the deleterious effects produced are owing less to the presence of any noxious principle in these substances, than to some peculiarity of constitution, or state of health in the individuals affected; and this opinion would appear strengthened by the fact, that, of a number of people who may have partaken of them, it frequently, though certainly not always, happens that only one suffers injurious consequences. What makes the subject particularly puzzling, is, that this person may have repeatedly before eaten of the same substances with perfect impunity, and may all his life afterwards continue to do so. There are, it is true, some individuals with whom particular kinds of food invariably produce deleterious effects; but the former case, as far as my own experience goes, is infinitely the more frequent. What explanation, then, are we to offer of the matter?

The experiments of Buchner and Schumann on sausages, would lead us to attribute the poisonous effects, occasionally produced by them, to the development of a peculiar fatty acid; while those of Henneman, Westrumb, and Hünefeld on cheese, tend to show that the noxious qualities now and then possessed by this article are owing to an excess of caseic, and to the presence of sebacic acid. The results of these experiments may afford a somewhat satisfactory explanation of those cases in which all, or at least a large majority of the persons who had eaten of the substances in question, were deleteriously affected; but in instances, by no means uncommon, where many have partaken, and yet only one has suffered injurious consequences, it is very difficult, or rather impossible, to believe that the articles eaten were in *themselves* poisonous.

In such cases it appears to me more rational to suppose, that, in certain states of the digestive organs, the articles of food above enumerated, or some portion of their elements, are converted into poisons by admixture with morbid secretions from the stomach or intestinal canal, or simply by some derangement in the process of digestion. This is an opinion which, in the present state of our knowledge, scarcely admits of direct proof; for the vital chemistry by which the several animal poisons are produced, has laws which we do not at all comprehend, and they themselves are of so subtle a nature, that, for the most part, we strive in vain to individualize them. We are compelled, therefore, to examine them in their natural condition, combined with substances which often do exist without them, and adding, moreover, to those substances no sensible properties indicative of their presence. Hence it is only by their effects on living bodies that their existence can be at all ascertained.

In explanation of these remarks, it is only necessary to allude to the venereal, the variolous,* the psorous, and other poisons, which exist combined with purulent matter, the sensible properties of which differ in nowise from those of common pus; also to the poison of rabid animals and of certain kinds of serpents, which is met with in fluids, the qualities of which, as appreciable to the senses, betray not its presence. But I must now come to the especial object of this paper, which is to show that pork either quite fresh, or salted only for a certain number of days, often gives rise in the human body to highly deleterious effects.

That fresh pork, especially with those who are unaccustomed to its use, is apt to produce diarrhœa, accompanied with griping pains in the intestinal canal, is, I believe, known even to the vulgar; but that it gives rise occasionally to symptoms similar in character and nearly equal in intensity to those occasioned by the most active inflammation, by perforation of the intestines, nay, even by the acrid poisons themselves, has not, as far as I am aware, been noticed even by any medical writer. It is stated, indeed, of the celebrated Dr Gregory, that he was accustomed to mention in his lectures, that, having been called to a gentleman said to be dying from gout in the stomach, he found him suffering, not from gout, but from pork in the stomach, and cured him speedily by an emetic. The fact, that the case referred to was mistaken for one of misplaced gout, and that the patient was considered in a dying state, proves sufficiently that the symptoms must have been violent, and very different from the simple sense of uneasiness created by the presence in the stomach of mere indigestible food; and the anecdote demonstrates that the learned and discriminating physician abovementioned was not ignorant of the deleterious effects which, as I shall show, very often result from the use of pork. One at least of the cases which I shall bring forward, will be found to have been attended with symptoms, which a superficial observer might readily have mistaken for those of misplaced gout, especially if the patient had been previously affected with that disease.

Case I. I shall first advert to a case in which the patient himself first conceived that he had been poisoned, and accused a young woman with whom he cohabited, of having, with the privity of her mother, who lived in the same house, administered something deleterious to him in tea, taken three hours previously. A medical man was immediately sent for, and he found the patient in the following state. The belly was not swollen, but an acute burning pain was felt in the umbilical and epigastric regions, attended with almost constant vomiting of a dark-coloured fluid, which contained a few pieces of pulpy macerated flesh, and other articles of food, more or less altered by the process of digestion. He complained also of a dry, burning sensation in his throat. His pulse was weak and faltering, his extremities cold, and a cold perspiration covered his face and forehead. These symptoms, coupled with the well-known bad character of the young woman and her mother, were not unlikely to produce a conviction that the patient's suspicions were well-founded, and, accordingly, the medical practitioner who was called did not feel himself justified in treating the case otherwise than as one of probable poisoning. He administered instantly an emetic, which brought up some more lumps of half-digested flesh, with immediate relief to the pain in the epigastric region, and the bowels being soon after acted on, the pain round the *umbilicus*, which had already begun to extend over the abdomen, was also speedily removed. On the next morning the patient was well enough to resume his work as a common labourer.

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* The peculiar odour emitted from the body of a variolous patient can scarcely be considered as an exception to this statement.

When this case was mentioned to me a few days afterwards, I stated to the medical gentleman who had attended it, my firm persuasion that all the symptoms had been produced by the presence of pork in the stomach and small intestines; and I felt assured of the fact from having repeatedly before witnessed cases similar in every respect, except that they had occurred under circumstances which precluded all suspicion of poisoning, so that upon strict inquiry, I had been able to ascertain the true cause of the affection. I directed his attention to the presence of pieces of flesh in the matter vomited, to the almost instantaneous relief which followed upon the operation of the emetic, and to the complete removal of all the symptoms after its cathartic effect; and I stated my assurance, that the patient would be found to have dined on pork on the day of his illness. To remove all doubt upon the point, I went to his house, and after inquiring the particulars of the attack, I asked what he had eaten at dinner, and was answered, as I had anticipated, that he had dined on boiled pork, and had partaken also of broth made from the same meat. The pork had been salted five days, and he had eaten of it once before without experiencing any unpleasant effects. His dinner hour had been one o'clock, and the alarming symptoms set in seven hours and a-half afterwards, namely, at half-past eight o'clock in the evening. The young woman and her mother, who had dined out of the same dishes, were not in the slightest degree injuriously affected.

This case seems to me highly deserving of consideration. Had the patient died under the attack, an event which, from the severity of the symptoms, could not have been regarded as very surprising, (although of many similar cases which I have met with not one has proved fatal,) the young woman and her mother would have, undoubtedly, been tried for his murder, and it is impossible to say what verdict might have been returned; for the notoriously bad character of the accused, the terms of disagreement on which they had for some time before lived with the young man, his own conviction that they had administered poison to him—all taken together, with the nature of the symptoms, might have appeared to the mind of a jury to form a tolerably strong and well-connected chain of circumstantial evidence. The negative results of experiments instituted with a view to detect the presence of poison might not have been considered conclusive of the innocence of the accused; for it is an undoubted fact, that in some cases where even the acrid poisons were known to have been certainly administered, no trace of their presence could, after a few hours, be detected. But it is useless to speculate further on what *might* have happened; for the mere circumstance, that the symptoms could not with certainty be distinguished from those of poisoning, proves sufficiently the importance of knowing that such a cause is capable of producing them.

But independently of the bearing which the case has on toxicological science, it is important also in a medical point of view; for it demonstrates the great and speedy relief obtained by the evacuation of the offending matter. All attempts to have assuaged the pains and the vomiting by anodynes, or to have roused, by means of cordials, the patient from his state of collapse, must have utterly failed until either the powers of nature or those of art, had effected the removal of the morbific substance.

The double seat of the pain is worthy of notice, as proving that part of the pork still remained in the stomach, while part had passed into the small intestines. In other cases the pain has been confined to the stomach alone, or it has been fixed in some particular portion of the intestinal canal, producing, according to the variation in its seat, a corresponding difference in the symptoms. I shall select from a large number of cases observed by me during the last six years, and of the particulars of which I have kept notes, a few of those which seem best calculated to illustrate these points.

Case II.—Charles Woolley, a hale and rather plethoric man, considerably above the middle age, was attacked about three o'clock in the afternoon with a pain, like that of cramp, at the stomach, so violent, that, as he himself said, "it quite took his breath." In fact, when I first saw him, an hour after the attack, the respiratory muscles of the chest, including the diaphragm, seemed almost spasmodically fixed, which was partly the consequence of a voluntary though instinctive effort, inasmuch as every tendency to a deeper inspiration aggravated greatly the pain. His countenance was pale and expressive of great distress; a few large drops of perspiration rolled down his forehead. His pulse was feeble and intermittent, and he had a sort of hiccough, every paroxysm of which was followed by an ineffectual attempt at vomiting. He complained that something lay at his stomach, hard and heavy as a stone. On inquiry, I found that, two hours before the attack, he had dined on *pork fry*, of which he had eaten rather moderately. He had taken brandy without any relief. While an emetic of ipecacuan, which I ordered him was sent for, he twice vomited a small quantity of acrid fluid, in which two or three small bits of bread and potatoe were discernible. The emetic acted speedily, and, its operation being encouraged by draughts of tepid water, he brought up several pieces of pig's liver and of fat pork, and soon afterwards he felt perfectly free from pain.

CASE III.—In October 1834, about five o'clock in the afternoon, I was requested to see a middle-aged man, of a healthy constitution, who had been suddenly attacked with excruciating pain in the site of the lower part of the *duodenum*, which was soon followed by vomiting of acrid matter, great exhaustion, tremors of the voluntary muscles, &c. When I saw him, rather more than an hour after the attack, he lay in bed with his limbs drawn upwards; his body was covered with cold perspiration, his features were collapsed and strongly expressive of suffering, and his pulse was faltering and irregular. He could not bear the slightest pressure in the region of the *duodenum*. The symptoms were all such as might, had there been previous disease, given rise to a suspicion that the intestine had been perforated. I found on inquiry that the patient had dined at one o'clock on roast pork, which had been killed only the previous day. He had not eaten immoderately, nor had pork ever before produced with him disagreeable symptoms. I ordered him thirty grains of ipecacuan, which produced vomiting several times, bringing up, at length, a quantity of bile, and with it, two little pieces of half-digested pork, which had their surface covered with a whitish gelatinous looking matter. On having his feet and legs put into hot water, the ipecacuan soon operated by stool, and then he experienced complete relief. He was able to resume his work on the second day after.

The patient's wife and two sons had eaten of the same piece of pork, without experiencing any evil effects. I examined some of it which remained, but could perceive nothing remarkable in its appearance. I had previously ascertained by repeated inquiries that the animals, whose flesh gave rise to such distressing symptoms, had not been affected with any notable disease.

Case IV. Towards the end of January last, a robust, healthy young man, being on business at a neighbouring market-town, dined on pork at about two o'clock in the afternoon. Between seven and eight hours afterwards, while returning home in a cart, he was attacked with an agonising pain in the region of the ileum, vomiting, &c. He continued, nevertheless, his journey, and while doing so, he "felt," to use his own expression, "as if his head had suddenly become too large for his hat." On the following morning the pain was still violent, and the vomiting, though less urgent, was yet very troublesome. He had been purged two or three times with considerable temporary relief. The abdomen was slightly swollen, and very tender. His whole face was swollen, particularly the eyelids, which were so tumid as almost to close up the eyes; and it was only by a forced effort that he could, even in the slightest degree, move them. There was no redness or vesication. His breast, legs, and arms, were covered with a rash resembling that of febrile *urticaria*, and his pulse was steady, quick, and sharp. He was ordered a draught, with a grain and a-half of tartar emetic, and an ounce of sulphate of magnesia, which operated actively both upwards and downwards. The pain and swelling of the abdomen, as also the swelling of face, had receded by the next day; but the rash on the skin appeared and disappeared by turns for nearly a week, and was cured only after repeated purging.

I have met with several cases similar in all their leading features to that just detailed. One, which might be considered as almost its exact counterpart, had occurred to me a few days before the preceding Christmas, a season at which the poorer class of people are very much in the habit of killing their pigs, and when consequently the malady is proportionately frequent.

Case V. A pale, unhealthy woman, after experiencing for a short time uneasiness in the abdomen, was attacked with a most excruciating pain in the sigmoid flexure of the colon. The pain was of such a nature that in a very few minutes she became quite exhausted, and declared repeatedly that she could not live. I saw in her little more than an hour after the attack. She had already taken two large doses of laudanum, and a considerable quantity of brandy, without experiencing the slightest relief. Her extremities were cold, her countenance had a cadaverous aspect, and her pulse was feeble and intermittent. She complained of a sense of sinking at the stomach, and a feeling of mortal weakness, together with nausea; but she had neither been purged nor vomited. The abdomen was slightly swollen, rather tense, and very tender. The patient's mind was perfectly collected but she could not be dissuaded from the belief that she was dying. In this belief I might perhaps have participated, thinking that perforation of the bowel had taken place, had I not been aware, from having met with many similar cases, of the true cause of all the alarming symptoms. I learned on inquiry that she had, on the day before, twenty-three hours previously to the attack, dined on boiled pork. This had been salted a fortnight, and the other members of the family had partaken of it without being in the least degree injuriously affected. She herself had never previously suffered from such a cause. Notwithstanding both these circumstances, however, I felt so firmly assured that the symptoms were produced by the pork, that I had recourse to a plan of treatment which, but for my well-grounded conviction, I would not have dared to venture upon. I prescribed pills, with cathartic extract, and one drop of croton oil, to be followed by a draught of salts and senna, and repeated, if necessary, after an interval of two hours. Fomentations to the abdomen were at the same ordered. The second dose of medicine produced two offensive stools with considerable relief of pain, and a third dose, by thoroughly clearing out the bowels, removed completely all the distressing symptoms. The abdomen, however, continued rather tender on pressure for some days afterwards.

In another case which closely resembled that just related, the patient, a delicate young woman, experienced for some days after the assuagement of the violent abdominal pain, very considerable difficulty in passing her urine, which was scanty, high-coloured, and scalding. This symptom is by no means a constant attendant on the affection, and was perhaps purely accidental.

Case VI. On the 24th of January last, I was requested to see a man advanced in life, and who had for several years laboured under symptoms of diseased liver, as well as under some obscure organic affection of the head, producing giddiness, imperfect vision, &c. He had for three hours before the time when I visited him, been suffering from a racking pain in sigmoid flexure of colon, for which he had used fomentations, and taken brandy, without any relief. I found the belly considerably swollen and very tender, the pulse feeble and faltering, and the tongue covered with a thick white fur. His extremities had been very cold, but their warmth was already restored by the application of heated bricks. He had vomited three or four times without any benefit. I ordered him pills with extract of colocynth, and one drop of croton oil, to be followed, as in the last case, with a draught of salts and senna, and repeated in two hours afterwards if necessary; but an injection was recommended previously to the administration of the second dose. All, however, proved ineffectual, and a third dose was consequently given. By this the bowels were very actively purged, and the patient soon afterwards found himself in a state of perfect ease. For a few days afterwards the abdomen continued sore, and tender on pressure. His diet was regulated, a light bitter infusion ordered, and at the expiration of a week he was restored to his ordinary state of health.

A few cases not unlike this last I have known to be mistaken for *peritonitis*, and treated by extensive depletion, without of course affording any relief to the patient. Nothing but the removal of the offending matter by vomiting, or by purging, or by both together, can effect any decided and favourable change in the nature of the symptoms. This is true even of those cases in which the patient has not been seen by a medical man until several hours after the commencement of the attack, during which time, by the administration of stimuli, or by the natural reaction of the system, the state of collapse has yielded to one of considerable excitement and fever. Such are the cases in which peritonitis is most likely to be suspected, and general blood-letting, leeching, blistering, &c. vainly had recourse to. It is needless after these remarks to insist upon the great importance of knowing the true cause whence the above-mentioned alarming symptoms proceed. I shall, therefore, close my communication by stating a few of the most important general facts connected with the subject in question, which a very minute attention to it for some years past has brought to my knowledge.

1. Pork has been found, under certain circumstances which we cannot as yet satisfactorily explain, to produce deleterious effects upon the human body.

2. Of several persons who have partaken of the same piece of pork, it has often happened that only one has been injuriously affected, and this person has, in general, repeatedly before eaten of the same species of flesh, nay, in several instances, of the flesh of the same individual animal, without having suffered in the slightest degree thereby.

3. Nothing remarkable could be discovered in the sensible properties of any piece of pork, the use of which had been followed by injurious consequences. These have been produced by boiled as well as by roasted pork; more frequently, however, by the latter. I have never met with a case in which they succeeded to the use of bacon, or of pork that had been salted for a period of more than three weeks. I have often been led to imagine that the lean part of pork is not capable of producing such pernicious effects. In every case that I have met with the pork eaten had been rather fat. The peculiar disease produced by it has oc-

curred also chiefly among people in the lower class of life, who are much more apt to eat of the fatter portions. Its prevalence among them, however, may be attributed, in part, to their dining solely on that species of flesh, and consequently eating more of it. But, again, the disease has often ensued where the quantity eaten has been very moderate; and my observations on the whole have convinced me that it is chiefly, if not altogether, to the fatty part of the pork that the pernicious effects are to be attributed.

4. The injurious consequences may begin to display themselves at any period within thirty hours after the pork has been eaten. When they occur within three hours afterwards, the stomach is the organ chiefly affected, and the symptoms are sudden and violent pain in the seat of that viscus; a sense of intolerable constriction over the chest; short, difficult, and imperfect respiration; in some cases intermission and irregularity of the heart's action, as discovered both by its own pulsations, and by the pulse at the wrist, which at the same time is exceedingly feeble. There is great prostration of strength, and a feeling upon the part of the patient as though he were on the point of expiring. The body is sometimes covered with cold perspiration, the extremities are cold, and vomiting soon takes place, and relieves to a certain extent the agonising symptoms. The exhibition of an emetic speedily removes them altogether, leaving only more or less soreness and general debility.

5. When from three to seven hours have elapsed before the deleterious effects show themselves, the symptoms are an acute exhausting pain in the region of the duodenum, or other part of the small intestines, perhaps also in the stomach, resembling in some cases so closely the pain produced by the passage of a gall-stone, that I have more than once seen it treated as such; vomiting, with or without tenderness over the seat of pain; a feeble, faltering, and, it may be, intermittent pulse, together with the other symptoms of collapse mentioned in the preceding paragraph. After a variable period, which is shortened considerably by the administration of stimuli and anodynes, the plan of treatment commonly pursued at the outset by those practitioners who never suspect the true cause of the symptoms, the pain changes its nature, becoming more pungent, the vomiting still continues, and there is perhaps an ineffectual desire to an evacuation by stool; the pulse rises and becomes sharp, the tongue is furred, the skin dry; the surface of the abdomen over the seat of pain tender, by and by it feels tense, and if copious evacuations are not speedily effected by means of emetics and purgatives, the whole abdomen soon becomes considerably swollen. Such cases are often mistaken for perforation of the intestines, *peritonitis*,

enteritis, iliac passion, &c. and bleeding, both general and local, opiates, and fomentations, employed in vain, until the practitioner, administering purgatives, (which he is led to do merely because the bowels do not act, and without any reference to the real exciting cause,) thus stumbles upon the proper plan of treatment, and speedily cures his patient.

When the affection is seated in this part of the intestinal canal, it frequently happens that the conjunctivæ become yellow; the face and scalp tender and swollen, but without erysipelatous redness or bullæ;* the eyelids are stiff and swollen; and the whole skin covered with an eruption of febrile *urticaria.* Active purgatives, preceded or not, according to circumstances, by an emetic, completely remove these as well as all other concomitant symptoms.

6. When the affection does not begin to display itself until after the lapse of seven hours from the time when the pork was eaten, the pain is usually felt in the cœcum, or some part of the colon nearer to, or more distant from, the rectum, in proportion to the length of the intervening period. It is unnecessary to detail the modifications of symptoms produced by this variety in the seat of pain. The vomiting is never urgent, and is often entirely absent; emetics are not indicated. This form of the affection is often mistaken for enteritis or peritonitis, and the patient, without any necessity, and with scarcely any relief, profusely bled. Nothing more is necessary than to purge him freely, and for this purpose I have usually ordered the croton oil, to be followed by a solution of sulphate of magnesia, in infusion of senna. The first copious stool invariably affords decided relief, but it often requires the purging to be kept up for several hours before the symptoms are entirely removed. Care, however, must be taken not to irritate the bowels unnecessarily. As a proof of the difficulty, in some instances, of evacuating offending matter from the bowels, I may state a case in which I was consulted about two years since. The patient, a little boy, after eating a quantity of mussels, was attacked with vomiting, pain and swelling of abdomen, &c. to which symptoms were added, on the following day, fits resembling very closely those of epilepsy. He had from twenty to thirty paroxysms in the day. His illness had continued for more than a fortnight when I was first requested to seem him, and he had, during that time, been actively and repeatedly purged. But notwithstanding this, I felt assured, that the fits depended on some portion of the mussels

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* I have met with two cases in which this statement did not hold, as in one there was redness, and in the other both redness and vesication. The patient, in the latter case, had a predisposition to erysipelas, of which disease he had more than once been the subject.

still remaining in the bowels. I ordered him, therefore, half a drop of croton oil, to be followed by a dose of black draught, and repeated every day, or every second day, as might be deemed advisable. After the second dose the fits entirely left him, nor did they afterwards return. The result justified, I think, the opinion formed. *

I have frequently seen the affection above described commence in the sigmoid flexure of the colon twenty-three or twenty-four hours after the pork had been eaten. In only one case has it made its appearance at so late a period as the thirtieth hour. In this case, with the view of speedily carrying off the offending matter, purgative clysters were primarily used; but they proved ineffectual, and it was found necessary to have recourse to the croton oil, &c. by which all the unpleasant symptoms were quickly removed. It has occasionally happened, that very soon after the commencement of the pain, and before the exhibition of any cathartic medicine, purging has set in; and in these cases the symptoms altogether might very readily have been mistaken for those of cholera. Even in such cases, the administration of purgatives constitute the only effectual plan of treatment, for if left to itself, or if treated by astringents, the affection is very apt to degenerate into dysentery. But here the croton oil is not indicated, the saline purgatives alone being sufficient for every good purpose.

I may here, although it seems scarcely necessary, remark, that the variations in the seat and symptoms of the affection, according to the period which may have elapsed between its commencement, and the time when the pork was eaten, will not always be found totally exactly with the description above given of them.. My statements must be considered as expressing merely *what I have generally observed to occur under the particular circumstances which I have specified.* This appears to me the most fitting method of delineating any disease; for to notice all the less important deviations from its ordinary course, only renders the subject obscure by making it unnecessarily complicated.

Although in remarking on the treatment of the disease, I have more than once alluded to the very insignificant power which cordials and anodynes have of relieving the most urgent symptoms, I would not, however, be understood as condemning altogether their use. In an early stage of the affection, and during the period which intervenes between the administration of the purgatives, and the commencement of their operation, stimulants and cordials may have some slight effect in lessening the sense of mortal weakness, of which patients almost always complain; but I must again impress the condition, that nothing short of the evacuation of the offending matter can afford complete and permanent relief. Fomentations to the abdomen are always proper, as they generally alleviate more or less the sufferings. In cases which have continued without proper treatment for several days, real inflammation may be excited by the offending matter, and require blood-letting, both general and local; but even here, to get rid of the exciting cause, is still a most important indication.

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* A case very similar to that above related is given by Orfila, on the authority, if I recollect rightly, of Dr Edwards. Vide *Toxicologie*, Vol. ii. p. 515, Case C. 2d edition, Paris, 1818.

Canterbury, 2*d July* 1836.

ART. IV.—*On the Vital, or Self-moving powers inherent in the Blood.* By RICHARD MADDOCK HAWLEY, M. D., F. R. C. Ph. E., &c. &c.

DR ALISON, the Professor of the Theory of Medicine, has shown by luminous experiments related in No. 126, p. 98, of this Journal, that in the higher animals, the motion of the blood through the capillaries does not depend solely on impelling powers extrinsic to that fluid: but that independently of those causes of its motion, a living, or self-moving power is inherent in the blood itself, acquired by its purification in the lungs, and in some degree retained through its whole circuit; so that if that salutary change be prevented by any cause, the motion of the blood necessarily ceases, though the other causes of motion should for a while continue to operate.

The experiments of Dr Alison seem to concur with some other evidences, I shall take the liberty to state, in establishing the truth of the following propositions:

I. That the motion of the blood from the branches of the pulmonary artery to the left auricle *principally* depends, neither on the systole of the right ventricle, nor on the tonicity of the vessels, nor on the respiratory motions; but on a living, self-moving power acquired by the blood, when renewed in the lungs: (This renovation, being, by the way, no trifling matter; but consisting, *always*, in the expulsion of carbon, or carbonic acid, the receipt of oxygen, and the sanguification of the chyle; and *frequently also*, in the expulsion of noxious matters, previously received by venous absorption at the serous or mucous surfaces.)

II. That the same living power, inherent in the blood, is also a material cause of its motion through the capillaries of the aortic system.

III. That in acute inflammation, this vital, self-moving power of the blood is morbidly increased; while the tonicity of the capillaries of the inflamed part is diminished.

IV. That some formidable diseases of the heart, lungs and brain, usually considered primary, may be referable to an altered state of this vital power of the blood; and perhaps oftener to its diminution than its augmentation.

I. That the action of the right ventricle of the heart, even aided by the respiratory motions and tonicity of the vessels, is utterly inadequate to the propulsion of the blood from the pulmonary artery to the left auricle, I infer, from the comparative tenuity of the walls of the right ventricle, from its condition in *articulo mortis*, and from the nature of the blood which it contains. Whatever be the amount of the stimulating action of arterial blood on the enclosing solids, the first place on which it can operate is the capillaries of the pulmonary artery, *i. e.* the place where the arterialization of the blood is effected. The state of the heart, *inter moriendum*, points to the same conclusion. Its left cavities are nearly empty, its right cavities are engorged, and they cease to act in the following order: *first*, the left ventricle becomes quiescent; *2dly*, the left auricle; *next*, the right ventricle; *last of all*, the right auricle. In other words, the contractions of the right ventricle continue, after the pulmonary circulation has ceased. If we compare the moving powers, commonly supposed to be the sole agents in the pulmonary circulation (I mean the systole of the right ventricle, respiratory motions, and tonicity of the vessels,) with the task actually performed, their inefficiency will at once appear. The task is not less than the propulsion of the whole blood of the body through a most intricate net-work of vessels, consisting of the minute ramifications of a single artery; where many well known retarders of motion must be in constant operation. As, therefore, the commencement of respiration is that of animal life, because the renovation of the blood in the lungs is essential to its circulation, by conferring on it a self-moving power: so in death, the same order of sequences is observed: *first*, the blood is no longer arterialized; *secondly*, its power of motion consequently ceases; and thus circulation and animal life are at an end. At birth, then, the motion of the blood begins, and at death it ends, in the same place, *i. e.* in the ramifications of the pulmonary artery; and thus respiration is seen to be the link which connects the two lives, the *organic* and *animal*, with each other.

These views appear to throw light on the pathology of asphyxia; and may lead to the correction of some errors as to that subject. Here, as in death from other causes, the first event in order is the non-arterialization of the blood; the next is the consequent cessation of its motion through the lungs.

The functions of the brain, voluntary muscles, and all other organs are quiescent, not because they receive mephitic blood, which acts as a poison; but because they no longer receive arterial blood. In short, blood of any kind, good or bad, ceases to flow to the aortic system; so that all the vessels of that system are found to be nearly empty, while the veins are overloaded. Neither is cerebral pressure the cause of the quiescence of the functions of the brain in asphyxia (unless when it is excited by hanging or compression of the neck from any other cause,) since the venous congestion, and the arterial depletion being proportional to each other, there is no morbid excess of blood in the vessels of the brain.

II. It is, I believe, an established truth in pathology, that syncope consists in the want of a due supply of blood to the cerebral arteries. We thus explain its sudden induction by the removal of pressure, or by the erect posture suddenly succeeding to the horizontal; or by any other similar cause. When syncope is thus *suddenly* excited, the carpal pulse may often be felt, though sensation and voluntary motion be at an end. May we not infer, that the arterial blood retains in a high degree the living power it had acquired in the lungs, even in the aortic capillaries of the limbs?

III. The doctrine, that a vital power is peculiarly resident in the blood, is further confirmed by the difference between blood circulating in a living animal, and the same blood a few minutes after detraction from an artery or a vein. When we say that the former consists of *lymph* and *red globules*, and the latter of *cruor* and *serum*, we state the important distinction, that the *lymph* of the former contains *liquid fibrine*, besides all the other chemical principles common to it with the *serum* of drawn blood. Wherever *fibrine* exists, with the exception of the circulating blood of the living body, it is a concrete insipid substance, insoluble in water at common temperatures. The spontaneous coagulation of the blood when drawn, consists simply in its *fibrine* assuming a solid form, *i. e.* the form natural to it, except as existing in the circulating blood. Whatever, then, be the cause of its fluidity, in the blood of the living body, the subtraction of that cause, when the blood is drawn, necessarily produces its coagulation. If, then, the living power I have ascribed to the blood, be the real cause of the fluidity of its *fibrine* (and no other adequate cause has ever been assigned,) it follows that the removal of this living power, on the blood being drawn, is the cause of its coagulation. It is generally admitted that the *buffy coat* is the result of an unusually slow coagulation, owing to which the red globules fall, before the *fibrine* has assumed the solid form. Dr Alison's experiments have proved, 1. that in inflammation the tonicity of the capillaries of the inflamed part (their sole vital power) is diminished: 2. that over-distension of the capillaries, and consequent redness, are the only phenomena of inflammation dependent on that cause. The febrile excitement existing in acute inflammation, the augmented velocity of the blood in the larger vessels, the tardy coagulation of the *fibrine*, inducing the *buffy coat*, and especially the peculiar products of inflammation, all point to the conclusion, that *though the tonicity of the capillaries of an inflamed organ be diminished, yet the living powers inherent in the blood are at the same time morbidly increased.*

If these views be correct, they may furnish an answer to the inquiry, why that organ, which in any individual is constitutionally weak and delicate, is peculiarly liable to inflammation, when the whole system is over-excited by any cause.

IV. If the doctrine, that a living, self-moving power is inherent in the blood be true, its practical importance must be great. Thus, it is obvious, that a diminution or augmentation of this power, either in the blood of the pulmonary or aortic capillaries, or both, must exert a powerful influence on the lungs, heart, and brain. For example, its diminution in the lungs may, in the first place, dilate the right heart, and venous system; and then, as a consequence, induce apoplexy, or dropsy. On the other hand, an augmentation of the same power may excite the signs of true hypertrophy of the heart. So that many formidable diseases of the vital organs, hitherto considered primary, may, in fact, depend on a change of the vital powers inherent in the blood.

If the above remarks should draw the attention of abler pathologists to this subject, my object will be accomplished.

Art. V.—*Remarks on certain Affections of the Cellular Tissue of the Legs.* By George Gulliver, Member of the Royal College of Surgeons, Assistant-surgeon to the Forces. (Communicated by Sir James M'Grigor, Bart., Director General of the Army Medical Department.)

The importance of the cellular substance in the animal economy, gives so much interest to the diseases of this texture, that I am induced to offer some observations on certain affections to which it is liable in the inferior extremities.

Those who have attended to the disabilities of soldiers must have remarked how frequently this class of men complain of inability to sustain the fatigue of marching, in consequence of swelling and pain in the feet and ankles, produced by this exercise. In many instances the cause of the affection is very obscure, and in some it may probably be ascribed to simulation; but I have seen cases in which the complaint was evidently connected with a change of structure in the subcutaneous cellular membrane of the legs, generally presenting itself in one of two forms.

In the first and most numerous class of cases, after the patient has been long subjected to the inconvenience of swelling around the ankles and back of the feet, the disease assumes a more inveterate character,—that of thickening and induration of the subcutaneous cellular texture, so as to leave no further doubt of the incapacity of the man for active service. In one instance, in which the disease attacked the right leg, the part was constantly bedewed with perspiration, emitting a peculiarly offensive odour. The affection sometimes occurs in both extremities, and frequently in one only.

In the second description of cases, although the soldier assigns the same cause of disability as in the preceding, the anatomical character of the disease offers a marked difference. There appears simply to be induration and rigidity, without thickening of the subcutaneous cellular substance. I know of no specific term by which it could be appropriately designated. The lower part of the leg, and frequently the back of the foot, appears hide-bound, the limb feeling hard and smooth, from loss of extensibility in the filamentous web, which no longer possesses that yielding looseness necessary to the due performance of its functions, so that the smallest fold of the skin cannot be grasped between the thumb and finger. The affection is unattended by swelling, except incidentally from unusual exertion. The examples which have come to my knowledge have been invariably confined to one extremity.

I subjoin instances of the two forms of disease comprised in the preceding remarks. Of the first, which, in its advanced stage, may be considered as a species of compact œdema, we find no account in the accurate Treatise of Dr Craigie, and only a doubtful notice by Dr Otto; and of the second, I am unaware of any description in the systematic books of pathology.

Case 1. *Early stage of œdema of the legs.*—A soldier of good character of the 71st Regiment, who was generally healthy, complained at Bermuda for several months, of swelling and pain in the feet and ankles, after marching or drill exercise. I often saw him when the parts were œdematous, a condition which generally subsided after a few days rest in the horizontal posture. The temperature and colour of the legs were natural. There was no evident cause for the affection, no apparent alteration in the veins or lymphatic vessels of the extremities. In consequence of the complaint he was found unfit for the service of the corps, and accordingly transfered to the Newfoundland Veteran Companies.

Case 2. *Chronic induration and thickening of the subcutaneous cellular tissue of the leg and foot.*—A robust-looking man, aged 27, of the 92d Regiment, a soldier of bad character, who had passed the whole of his seven years service at home, was admitted into the general hospital with swelling of the lower part of the left leg and back of the foot. The affected part was hard, but pitted slightly when firmly pressed, and the colour and temperature were natural. No change could be detected in the veins or lymphatic system of the limb. He stated that he had long been subject to pain and swelling in the foot after an ordinary march, which, however, generally subsided in the course of a few days. The affection subsequently became more obstinate,—two small superficial sores appeared on the back of the foot, and he was no longer able to continue his duty. The sores healed in about a fortnight; but, notwithstanding the employment of active, general, and local treatment, the leg remained without alteration, except that the swelling and hardness of the cellular substance somewhat increased. Suspicions were entertained that the disease was produced or kept up by artificial means; but a vigilant attention to the case soon induced us to acquit him of this accusation. He afterwards had an attack of acute rheumatism, principally affecting the arms, from which he shortly recovered; but the œdematous state of the leg and foot continued, and he was consequently discharged from the service, after many months confinement in hospital.

Case 3. *Induration without thickening of the subcutaneous substance of the ankle and foot.*—A soldier of spare habit, aged 37, much debilitated by long service within the tropics, was admitted into the general hospital, complaining of weakness in the right foot, which he said was subject to pain and swelling after a march.

The skin of the ankle and back of the foot was very hard, nearly immoveable on the subjacent parts, and of an unusual smoothness, so as to give the idea of distension, but accurate measurement proved the affected part to be unaltered in circumference. No other change could be discovered in the limb;—the ankle and tarsal joints were healthy.

He attributed the disease to an accident which befell the foot five years previously at Bombay, in consequence of which he was some time in hospital. He soon recovered from the immediate consequence of the accident; but the hardness and tightness of the skin (to use his own expression) came on gradually, and he was consequently unable to march without swelling of the leg and foot.

No improvement took place in the part while he remained in hospital, from which he was discharged unfit for further service.

CASE 4. *Induration of the subcutaneous cellular tissue of the leg, without thickening.*—John Hill, aged 41, 40th Regiment, had passed the latter years of his service in India. He was admitted into the general hospital, complaining of being unable to march a short distance without lameness of the left leg.

The skin of the lower part of the limb appeared very smooth, and firmly bound down to the subjacent parts, so that it hardly admitted of motion, much less could a duplicature of it be made between the thumb and finger. The part felt altogether firm and unyielding, but there was no swelling whatever, and the colour and temperature were unaltered. The limb appeared otherwise healthy.

From the document which accompanied Hill from India, and from his own statement, it appeared that he had suffered from chronic dysentery, remittent fever, and purpura of the inferior extremities, which were much swollen and painful, but soon recovered their usual size. The hard unyielding state of the cellular substance succeeded, and remained up to the period of his arrival at Fort Pitt, where he was found to be unfit for further service.

Although my observations lead me to believe that these diseases are by no means uncommon among soldiers, it appears unnecessary on the present occasion to multiply examples. I have had no opportunity of examining any of the cases by dissection, but I hope that this short notice will induce others of greater experience to furnish us with a more perfect account of the pathology of these affections.

The chronic induration and thickening of the cellular substance may probably arise from a variety of causes, of which repeated attacks of erysipelas appear to be one; but the two first cases described in this paper, as well as others which I have seen, were not preceded by inflammatory symptoms. Nor was there any swelling or pain in the tract of the absorbing vessels, as in some examples of Arabian Elephantiasis described by M. Alard; and the explanation offered by M. Brechet and some continental pathologists of that disease of the cellular tissue in young children, to which M. Alibert has given the name of *Scleremia*, is equally inapplicable to the cases under consideration. It would appear merely conjectural to refer the affection to a change in the veins; but the following circumstances are worthy of remark in connection with the subject;—viz.

1. The examples of *phlegmatia dolens* adduced by Dr Lee and Mr Lawrence from inflammation of veins.

2. The observations of Dr Davy in the dissecting-room at Fort Pitt, from which it results that a frequent immediate cause of œdema in the lower extremities, accompanying diseases of the thoracic viscera, is the accumulation of sanguineous clots in the veins of the limb, unaccompanied with obvious inflammation of these vessels.

3. Although in many cases of chronic œdema, no alteration in the venous trunks can be discovered during life, irregular congestion of the cutaneous capillaries is not unfrequent; and every surgeon knows that swelling of the inferior extremity is common in connection with a varicose state of the veins and ulceration of the part.

But we have no reason to suppose that the induration without thickening of the cellular substance is dependent on any change in the veins; and, until the precise anatomical character of the disease has been shown by dissection, the descriptive appellation should be admitted with reserve. From the unaltered size of the limb, it is difficult to ascribe the hide-bound condition of the part either to hypertrophy or atrophy of the cellular substance; for which reason it appears most probable that the affection is simply an induration or rigidity of this texture,—an effect probably of very slow inflammatory action, sometimes arising from local injury, and not unfrequently without any assignable cause.

Chatham Barracks, 1836.

ART. VI.—*Case of Fracture of the Neck and Trochanter of the Thigh-bone, attended with Inversion of the Limb.* By GEORGE GULLIVER, Assistant-Surgeon to the Forces. (Communicated by Sir JAMES M'GRIGOR, Bart. Director-General Army Medical Department.)

NOTWITHSTANDING the statements of Paré, Petit, and Dessault, concerning inversion of the limb in fractures of the neck of the thigh-bone, it is now known that this symptom is so seldom present, that farther observations are required to enable us to estimate its relative frequency and importance in this injury.

In one form of fracture of the neck of the thigh-bone, Mr Guthrie has offered an explanation of the cause of inversion of the limb, founded on a consideration of the direction of the fracture in relation to the attachment of the muscles rotating the thigh outwards. Whenever the fracture is external to the insertions of the *pyriformis*, *gemelli*, *obturatores*, and *quadratus*

Mr GULLIVER'S CASES OF SHORTENING OF THE THIGH BONE.

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Fig. 1.

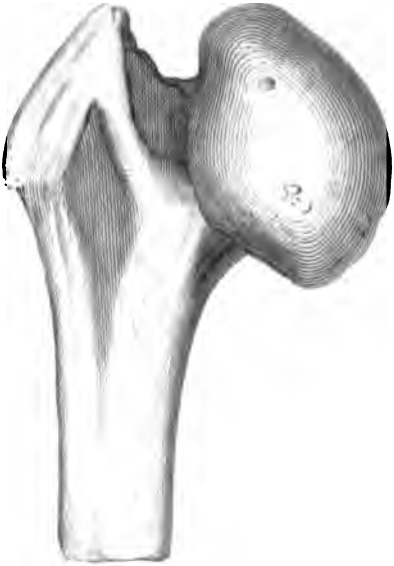


Fig. 3.

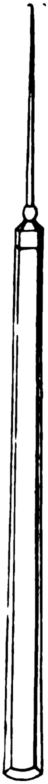
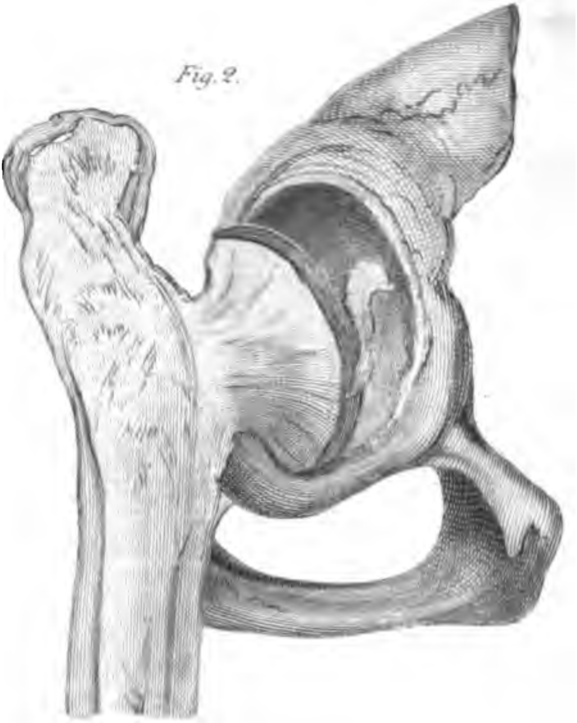


Fig. 2.



muscles, yet sufficiently with the insertion of the *glutæus medius* and *minimus*, Mr Guthrie states that the toes will be turned inwards. The case which I subjoin tends to confirm this observation.

An insane officer, aged 39, fell on his right hip, and fractured the neck of the thigh-bone. Shortening and inversion of the limb immediately followed, and remained until his death, which took place from disease of the lungs eleven months after the accident.

The thigh-bone exhibits fracture of the neck at its junction with the shaft, the fracture extending downwards and backwards through the great, to the basis of the little trochanter, thus detaching the posterior part of the former and the whole of the latter process with the upper fragment. The head of the bone is considerably depressed, but the fracture is firmly consolidated by abundant deposit of new osseous matter, an arch of which extends from the anterior inferior spinous process of the haunch-bone, across the front of the joint to the upper part of the shaft of the thigh-bone.

This portion of adventitious bone became detached during the process of maceration, having been connected only by fibro-cartilaginous substance to the neighbouring bones,—a circumstance which shows the facility with which bone may be formed in the soft parts contiguous to a fracture, when displacement of the fragments or any other cause excites a high degree of ossific action. In overlapping fractures in the lower animals, I have frequently observed a distinct centre of ossification established in the concavity formed by the fragments, a considerable time elapsing before this *accidental callus*, as it might be termed, acquired a connection with the old bone.

The parts above described are preserved in the Museum of the Army Medical Department at Fort Pitt.

Chatham Barracks, July 1836.

Art. VII.—*Case of shortening of the Neck of the Thigh-Bone in a young subject, being an Appendix to a former paper on the same affection.* By George Gulliver, Assistant Surgeon to the Forces. (Communicated by Sir James M'Grigor, Bart., Director-General of the Army Medical Department.)

In the 128th Number of the Edinburgh Medical and Surgical Journal, I submitted to the profession an account of some cases of shortening of the neck of the thigh-bone, occurring in young and middle aged subjects, in one of which the history and dissection afforded satisfactory evidence that the disease was consequent on contusion of the great trochanter, without fracture. I have now to offer a similar example, in which, however, the alteration of form in the surfaces of the hip-joint is as remarkable as the shortening of the neck of the bone. Of the practical importance of these cases no doubt can be entertained, since they afford proof of lameness from an affection which has hitherto attracted but little attention.

Case 5. John Lynn, aged 19, a stout active recruit of the 38th Regiment, fell into the hold of the ship, in which he was proceeding to join his corps in India, and injured the right hip, in consequence of which he was confined to his berth. On his arrival in India, about three months after the accident, being perfectly well, he was attached to the light company of his regiment. He continued to perform the active duties required of him in this company for about three years after the accident, when he became very gradually lame in the injured limb, and was accordingly admitted into hospital. When he had been about eighteen months under treatment, the infirmity increasing, he was considered to be unfit for the service. His general health had been throughout good, and he was accustomed to move about with the assistance of a crutch, but was so much addicted to the drinking of spirits, that it was deemed expedient to retain him in hospital till he could be brought before the annual invaliding committee. While detained for this purpose, he was bit during the night by a snake (*Bungarus lineatus.*) from the effects of which he died in a few hours, being then twenty-four years of age.

The hip-joint, which has been presented to the Museum of the Army Medical Department by Dr Dempster, exhibits remarkable shortening of the neck, and enlargement of the head of the thigh-bone, with a suitable change of form in the acetabulum.

The head of the bone is enlarged principally around its inferior border, as if from expansion, its upper and front part being flattened, so that the articular surface extends anteriorly close to the shaft, while the neck presents a greater extent posteriorly. The acetabulum is much widened and remarkably shallow, corresponding to the alteration of shape in the head of the bone. A section, made in the usual direction through the upper part of the thigh-bone, exhibits the centre of its neck hardly half an inch long. There is no appreciable diminution in the density or strength of the bone; and the compact shell of its neck, as well as the cancellous structure, appears throughout perfectly natural. The articular cartilages, as far as can be ascertained from a dry but imperfectly macerated preparation, appears of the usual thickness, and without traces of ulceration.

In a case described in the former paper, shortening to the extent of half an inch had taken place as early as the fifth or sixth week after the injury,—a circumstance which would have led me to conclude that fracture had occurred, if I had not satisfied myself to the contrary by repeated examinations. The rapidity with which the neck of the thigh-bone may be diminished, receives illustration from a case of fracture of this part recently described by Mr Howship, in which the neck had lost half an inch of its length by absorption on the third week after the accident,—a phenomenon of which I know of no parallel examples in other fractures.

I append two drawings, for which I am indebted to Assistant Staff Surgeon Rolland, exhibiting the shortening of the neck of the thigh-bone, and modifications of form in the articular surfaces.

Fig. 1 of Plate II. represents a front view of the upper part of the thigh-bone of John Lynn, aged 24, the subject of the present case.

Fig. 2 of Plate II. exhibits the acetabulum, with a section of the thigh-bone attached to it by the round ligament. From J. Fox, aged 32, whose case is described in my former paper.

Chatham Barracks, 1836.

Art. VIII.—*Observations on the use of the Hook in the extraction of Foreign Bodies from the Ear.* By Ninian Hill, M. D. Greenock.

Having read some time since, an account of a case of an unsuccessful attempt to extract a foreign body from the ear of a child, wherein it was stated that the surgeons had recourse to the useless and unscientific operation of laying open the cartilaginous portion of the canal, after the usual means of the syringe and forceps had no doubt been tried. In the course of practice, I have often been called to remove foreign bodies from the ears and nostrils of children; an affair easily accomplished in the majority of instances. But again, I have found it no easy task to dislodge them when imbedded for days, the parts irritated, and the child alarmed, by the vain attempts of ignorant people, who, as they often could see and reach the object, conceived it might easily be removed by means of a bodkin or needle.

About a year ago, I was sent for in the afternoon to visit the daughter of a clergyman, a child of five or six years of age, who had pushed a seed of Indian corn of foreign growth into the left ear the day before. On examination, I saw the white part by which it adhered to its stock. It was beyond the curve of the meatus, within the osseous part of the canal, close to the tympanum, in consequence, as I suspected, of efforts made to extract it previous to my being called. I was furnished with a good two-ounce syringe and a choice of forceps, so that I had no doubt but I should accomplish the extraction in a short time. In this I was deceived. The injecting by the syringe made no impression on it, and the forceps pinched off small portions rendered soft by the tepid water. The child screamed and struggled violently, terrified with the noise and force of the water thrown into the ear, and she got so heated and flushed that I feared convulsion fits if I persevered; and as I had literally wrought for more than an hour, I was glad to plead the absence of daylight as a reason for postponing farther trials until next day.

On the morning I brought a very small hooked instrument, such as is to be found in a case of eye instruments, a fac-simile of which is delineated in the first plate of Gibson's work on the Formation of an Artificial Pupil, published in 1811, (Plate II. Fig. 3;) being perfectly assured that neither the syringe nor the narrow-bladed forceps would effect the removal of the seed, now swollen from the heat and moisture, so as to be still more completely impacted than at my first visit. To have a better command of the child than formerly, she was firmly swathed in a table-cloth, so that the attendants could manage her with more ease. Laying hold of the ear with the finger and thumb, pulling it upwards and backwards, so as to overcome the natural obliquity of the passage, I passed the hook along the inferior surface of the tube until I felt resistance from the lower margin of the *membrana tympani*, when, by a slight motion of the fingers, I turned the point of the hook upwards, getting it behind the object, and it was drawn out in a moment, to my great relief as well as that of the little sufferer.

Situated as I was in regard to this case, I of course spent the evening in search of what information I could obtain from the writers on acoustic surgery.

Saunders, in his work on the Diseases of the Ear, gives no directions for such accidents. Itard, as quoted in the 19th volume of the Edinburgh Medical Journal, recommends the *chirurgie expectante* in cases of the above description; while Mr S. Cooper, in the fifth edition of his Surgical Dictionary, as we shall see by the following extract, advises the *chirurgie heroique et perturbatrice.* "If such substances," he writes, "should make too much resistance, forceps with stronger blades for breaking extraneous bodies must be employed, and then the fragments are to be extracted piece-meal; but in those cases, before attempting extraction, a little oil of almonds should be injected. The presence of foreign bodies in the ear often occasions the most extraordinary symptoms, as we may see in the fourth observation of Fabricius Hildanus."

It seems singular that any person having a knowledge of the structure of the ear could give such directions, as to use the forceps of such a power as could crush a hard body like a seed of Indian corn, or a piece of glass, as occurred in the case related by Hildanus, which is copied into the Surgical Dictionary, to corroborate the preceding mode of practice. If such an instrument were made use of, the most probable result would be rupture of the tympanum, and destruction of the *ossicula* forming the organ of hearing, the chances being, that the extraneous body would be driven into the internal ear, and excite inflammation in the interior of the cranium. If any other person had given these directions for the treatment of such cases, Mr Cooper would have conceived it his duty to point out the fatal effects ensuing from want of anatomical knowledge on the part of the surgeon who gave such advice.

Dr Thomas Buchanan, in his work on Acoustic Surgery, page 40, says, " if it slip from the forceps inwards, the injection must again be tried ; if it again remain fixed, the operator must then endeavour to extract it with more dexterity than in his former effort." From these extracts it is evident that I was unable to obtain any hint calculated to assist me in my dilemma, as none of the authorities quoted allude to the possibility of employing any other means than the syringe and forceps.

Before illustrating the advantages of the hook, I may remind the reader that the auditory canal is from ten to twelve lines in length; that the *membrana tympani* is placed at about an angle of 45° from its central line; and that this obliquity causes the inferior part of the tube to be nearly a line or more longer than that of the superior, while the exterior surface of the membrane is concave. From this conformation of the parts, it is evident that a bead, cherry-stone, or pea, when pushed up to the *membrana tympani* will be in contact only with its upper part, leaving a vacant space below, which, together with the concavity of the membrane, permits the hook to act with the greatest facility ; and it is in this space that the water from the syringe makes a lodgement so as to form the *vis a tergo*, which forces the foreign body forward. This hook is so slender and light, having the point well turned up, that it can be used with all the delicacy of the finest probe, and can easily be carried alongst the parietes of the canal so as to get behind any object. In operating with the forceps we are very apt to drive the foreign body further into the canal, whilst each limb of the smallest forceps that can be constructed must occupy double the space of this hook; if the points are bent inwards, as recommended by Dr Buchanan, they of course require the greater space to act. The tube is in many individuals very strait, so as not to admit of the play of the forceps. Sometimes in removing indurated wax long impacted in the ears of aged people, I have often been tempted to use the probe as a lever to move the hardened mass, on which the syringe made little impression. In such cases this hook will be used with more effect and less danger to the tympanum, as it can easily cut pellets of wax into fragments; or should a fibre of cotton or wool form the nucleus of the obstruction, the hook will the more readily extract it, while its convex part being always towards the tympanum, it cannot injure it.

The syringe, in most instances, I should think a safe means. Yet, as in the case related, I have met with children who, from fear, would not allow it to be had recourse to; while in the case of seeds which swell from imbibing moisture, the propriety of using it may be questioned. I have even met with adults who became sick under its operation.

To illustrate farther the principle of the hook, I may mention that a boy of three years of age was brought to me, having a waistcoat button up his nostril, which was discharging purulent matter. The button had been lodged for more than eight days, and repeated attempts had been made to extract it. From the common dissecting-hook I broke off more than a third part of its hook, leaving still a considerable curve; and having rounded the broken part, it was easily introduced, and brought out the button at the first attempt. I have since removed a pea from the nostril of a child as cleverly with the same instrument. From these statements, I am confident that any one having recourse to the hook in such cases, will find it all times more efficient than the forceps, the use of which I think it will supersede in accidents of the above description.

Greenock, 11*th June* 1836.

Art. IX.—*Case of Irritation of the Cerebro-Spinal Axis, causing Mental Derangement, Trismus, and Palsy.* By Alexander Cockburn, Esq. Surgeon, R. N. With Pathological Observations, by Dr Craigie.

On the 27th June 1835, I was requested by Dr Molleson (who was about to leave town for some time,) to visit Christina Ferguson, aged 25. She had been labouring under symptoms of an affection of the spine for nearly two years. And for the last eighteen months had been almost entirely confined to bed, having little or no power over the lower extremities. About a fortnight previously, she was seized with a convulsive affection of the muscles of the neck and lower jaw, which, after continuing for three or four days, ended in complete *trismus* or spasmodic closure of the lower jaw. The affection of the spine had been treated by issues to the seat of the disease, which was about the last dorsal *vertebrae*, as also various internal remedies, with the view of improving her general health, but without producing much material benefit. I was given to understand, that, from a girl, she had been subject to *hysteria;* that her bowels were generally constricted, and the *catamenia* irregular, and since her present illness, more particularly so, and for the last five months, the uterine secretion had not appeared.

At the time when I first saw her, her countenance was pale and languid, her eyes were dull, with the pupils a little dilated. The pulse was about 90 and small, the skin natural. Since the jaw became locked, she fed herself with a teaspoon, at the right angle of the mouth, where she had lost some of her teeth. In this way she had been supported for the last ten days, with beef-tea, wine, &c. Her bowels not having been moved for two days, I directed two drops of croton oil to be given immediately. The beef-tea was continued, but the wine was omitted.

On the 28th, I was prevented from seeing her; but on the following day upon visiting her, I was much surprised to find her out of bed, dressed, and walking about the house, with the perfect use of her limbs, but in a complete state of mental derangement. Her sister, who slept with her, stated to me that, on the preceding day, which was Sunday, the family observed that she was very indifferent to their reading or conversing with her upon religious subjects, as formerly, and in the evening, while reading to her, she smiled and shook her head, and her behaviour was altogether quite different from what it had formerly been,—being very piously inclined.

On Monday morning about five o'clock, she got out of bed, dressed herself, pulled up the window, and was in the act of getting out at it, when her sister caught her. She became extremely violent, and resented every opposition to her wishes, by striking and throwing whatever came in her way at those about her. Upon finding her in this state I ordered her to be placed in bed and secured, the head to be shaved, and cold cloths applied to it, a blister to the nape of the neck, and a brisk purgative to be administered.

On the 30th, I found her up, and incapable of being kept in bed. She was indeed exceedingly restless, constantly moving from place to place; and had so much strength that it required two or three persons to hold her. My young friend, Dr Gordon, being with me, we had her secured in bed; and I directed a spoonful of the solution of tartrate of antimony to be given every second hour. The *trismus* continued the same.

July 2d. She had continued much the same since last report. Her relations were averse to her being put under restraint, so that she had been very little in bed. Her strength, however, continued unimpaired, and she was very violent towards those about her. Dr Abercrombie saw her with me to-day, and recommended the blisters to be continued to the head, and the bowels well purged with the croton-oil.

3d. The blister applied yesterday over the whole head had risen well; and the bowels had been fully opened. But the mental excitement continued unabated; the pulse was about 100, and small; and the pupils were much dilated, with strong maniacal expression. *Cont. medicamenta.*

July 8th. She had continued much the same since last report. The blistering and purging has been continued, but it is with difficulty she can be made now to take medicine, being apprehensive of being poisoned. Dr Atkinson of the H. E. I. Company's Service saw her with me to-day. She was in a high state of excitement, was sitting in a corner of the apartment with a pair of kitchen bellows in her hand, brandishing them at whoever came near her. I urged upon the friends the propriety of her being put in a strait waistcoat; but to this they would not agree. *Cont. medicamenta.*

On the 11th, I found her much quieter; still, however, out of bed, and her mind deranged. The blister is discharging copiously, and her bowels have been freely opened. To-day she was seen by Sir George Ballingall, who recommended the same treatment to be pursued. *Cont. medicamenta.*

12th. Last night as she became much exhausted, she was undressed and put to bed. She then fell into a sound sleep, and slept till seven this morning, when she awoke with her mind perfectly restored, recollected nothing of what had occurred, but supposed herself to have had a fever. She was still unable to move her limbs, and complained of general uneasiness over the whole body. The pulse was about 90, and soft; the skin moist; and the bowels open; but the *trismus* continued. She was ordered to have beef-tea, and to be kept quiet.

13th. Slept well during the night. The mind was perfectly restored, but she again lost the entire use of her limbs. The pulse continued about 90; bowels open. *Cont medicamenta.*

14th. To-day she was lifted out of bed to the sofa. She has no power or command over her limbs, and cannot stand without being supported on both sides. She takes beef-tea, and the bowels are kept open with croton oil. The spine is rubbed morning and evening with a strong stimulating liniment, and the lower jaw, which still continues firmly locked, has been blistered on both sides.

26th. For the last eight days she has continued much in the same state, sitting up daily, but unable either to walk or stand without being supported. Her mind has been quiet and tranquil, but the *trismus* continues. To-day she is in bed, and complaining of headach. Her pulse is 90. The bowels have been rather confined.

A blister was applied to the neck, and a dose of croton oil was ordered to be given immediately.

27th. Last evening she insisted upon being out of bed; became perfectly deranged; rose, dressed herself, and has walked almost constantly about the house ever since. At present the pulse is 100. The pupils are much dilated. The bowels have been opened. The *trismus* continues.

A blister was applied over the whole head; and her attendants were directed to endeavour to keep her in bed.

28th. She has not been in bed these two nights; is highly excited and in constant motion, and most anxious to be out, to prevent which it was requisite to secure the doors and windows. The strength is most surprising. The pupils are much dilated; the pusle 110, and sharp; bowels open. The blister on the head has risen well. Another to be put along the spine.

29th. The blisters on the head and along the spinal column are discharging freely. The mental excitement is now a little abated. The pulse 96. *Rept. Ol. Croton, medicamenta.*

30th. She is much quieter to-day, but the mind is still deranged. The blisters are discharging copiously. The pulse about 100. The bowels open. My friend Dr Craigie, one of the Physicians of the Royal Infirmary, saw her to-day.

August 1st. She continues in bed, and the mental excitement is much abated. *Cont. omnia medicamenta.*

2d. Is quiet and in bed. The blisters still discharging. *Cont. medicamenta.*

3d. She is quite calm, but her mind is not yet restored to its proper state. The *trismus* continues, and she complains of great pain in applying any degree of force to separate the jaws. The pulse is 80 and soft, and the bowels are reported open. *Cont. omnia.*

4th. To-day she is perfectly collected, but feels much exhausted. *Cont. medicamenta.*

6th. She is much better; can move her limbs, and turn herself in bed, but when up she is unable to stand without support.

8th. She can walk a little to-day with assistance, but feels very weak. The pulse is 80. The bowels are opened. The *catamenia* appeared to day.

10th. The mind is perfectly restored. She complains of great debility, but walks through the room with assistance. *Cont.*

14th. She can open her mouth a little to-day. The *catamenia* disappeared on the 12th. *Cont. medicamenta.*

18th. Convalescent. *Cont. medicamenta.*

22d. She walks much more firmly, and can open her mouth to the full extent, but complains of pain and rigidity of the muscles of the lower jaw in masticating her food.

20th. Continues to improve; and I have recommended her going to the country, which she means to do in the course of a few days.

After remaining a few weeks in the country, she returned home quite well, and continues so till this time.

Edinburgh, March 1836.

Observations on the preceding Case, by Dr CRAIGIE.

The case now detailed, which I saw with Mr Cockburn, though not singular, is, in many respects, highly important, more especially in illustrating the connection which is not unfrequently observed in young females between symptoms of hysteria and symptoms of irritation of the cerebro-spinal axis.

In the case of Christina Ferguson three classes of symptoms were presented.

1. She had been originally subject to hysterical symptoms, which there is good reason, from the subsequent course of the case, to believe proceeded from irritation of the spinal chord or its envelopes, or perhaps, to speak more to the fact, from a languid and inert state of the circulation within the rachidial vessels, and a consequent degree of congestion, which first irritated and then compressed slightly the spinal chord and the origins of the nerves. This state might either proceed from the previous disorder of the alimentary canal and its vessels and the splanchnic nerves, as I have elsewhere attempted to explain regarding these affections of the spinal chord and nerves, or might be simultaneous with it, and when once induced within the spinal chord, would, doubtless, contribute to aggravate greatly the torpor and insensibility of the alimentary canal.

2. The second class of symptoms were those of actual Spinal Irritation. These appear to have commenced when she was about 23 years of age, in the form of great sensibility and tenderness of the lower dorsal vertebrae, the usual seat of this extreme sensibility, and gradually proceeding to affect the mobility of the muscles of the lower extremities. That these symptoms and the subsequent loss of power depended on irritation rather than inflammatory disease of the spine or its parts or contents, I think it to be inferred not only from the subsequent history of the

case, but also from the state in which she was, when I saw her under treatment by Mr Cockburn. In the *first* place, the painful sensation was exactly at that part of the spine in which I have seen this increased sensibility take place in other patients, in whom the symptoms proved to be those of irritation only or neuralgia of the spine. (*Rachialgia.*) *Secondly*, the loss of power in the lower extremities appears to have been of that kind which usually attends spinal Irritation or *rachialgia*. When this loss of power arises from inflammation of the vertebral cancellated tissue or its *medulla*, or from disease of the capsules of the articular processes, it produces in general, first, impaired power of the extensors with involuntary drawing of the flexor muscles, and eventually very complete palsy of the lower extremities. There is, in short, first, a subversion of the antagonism, and then palsy afterwards. In general, on the other hand, when the impaired motion proceeds from mere irritation, it is a gradual but general loss of power affecting all the muscles, both flexors and extensors, at the same rate, and in a slighter degree than in the palsy from chronic inflammation of the medullary membrane or cancellated tissue of the bones. In the one case, the loss of power corresponds to the *paresis* or relaxation of the ancients; and in the other it is genuine *paralysis* and *paraplegia*. *Thirdly*, when I examined the back of Christina Ferguson in August 1835, the dorso-lumbar region presented no trace of any change in structure having taken place. There was neither depression, nor prominence, nor distortion; and, with the exception of morbid sensibility over the site of the lower dorsal *vertebræ*, there was nothing to indicate that there had been any serious disorder of the parts composing the spine or its contents.

The symptoms of spinal irritation appear to have continued for about eighteen or twenty months, and to have given rise not only to the gradually approaching loss of power in the trunk and lower extremities (*paresis*,) but to have aggravated if not induced, by a sort of reflected action, the torpid state of the alimentary canal and the intestinal secretions, and also the inert state of the uterine circulation, as indicated by the cessation of the menstrual secretion.

3. The third class of symptoms presented by this case was that of irritation of the cerebro-spinal axis. And in the existence of these symptoms, two circumstances deserve attention. The first is the transition of the symptoms of irritation of the spine into those indicating irritation of the whole cerebro-spinal axis; and the second is the extent to which the latter symptoms proceeded, and the form which they assumed.

On the first point, it is important so observe, that though the early symptoms of the disease, which continued from August 1833 to June 1835, were such as denoted chiefly an affection of the spinal chord and its investments, and perhaps principally of the vessels of these parts, yet after this had continued for the space of twenty months, it evinced proofs of passing onward to affect not only the spinal chord more generally but the cerebral membranes and substance. The first indication of the more general affection of the spinal chord took place on the 12th of June, in the shape of spasmodic closure of the lower jaw. Though the tonic spasms never proceeded farther than this, yet the circumstance of their occurrence indicated most unequivocally the subversion of the antagonism in the muscles of this order; viz. the loss of power in the depressors or extensors, and the irritation inducing involuntary contraction in the levators or flexors. When I examined the jaw, it was interesting to observe the rigid contraction of the temporal, and especially of the masseter, muscle on both sides, and even in some degree of the buccinators, and the complete inadequacy of any extending force to separate or depress the lower jaw.

It is here important to observe the pathological reason of this tetanic affection of the flexor or levator muscles of the lower jaw appearing exclusively, and without more general affection of other muscles of voluntary motion. It is manifestly dependent upon the anatomical fact, that the temporal, *masseter*, *buccinator*, and pterygoid muscles are supplied exclusively by the small or muscular division of the fifth pair of nerves. It was originally shown by Palletta,[*] and afterwards more pointedly by Bellingeri, that this small or muscular division of the fifth pair is distributed to these muscles; and though it receives filaments from the automatic, involuntary, or large portion of the fifth pair, it is chiefly occupied in regulating the motions of elevation of the lower jaw. Palletta had already observed that this portion might be sympathetically or idiopathically affected by *trismus;* and in this view he is followed by Bellingeri. It would have been more physiologically accurate to say, that irritation applied to this nerve, to its roots or origins, or to its branches or filaments, or to any part of its neurilemma will be, according to the ordinary laws of nervous irritation and action, followed by spasmodic motions, generally tonic, in the muscles to which its branches are distributed. It it impossible to doubt that this is the true cause of those cases of *trismus* or locked jaw, without general tetanic affection, which take place in hysteria, epilepsy, slight cases of apoplectic seisure called cataphora, and similar affections of the nervous system.

I may further at the same time observe, that though *trismus* is very generally to be regarded as a mere part and symptom of tetanus, yet in general, and more especially in such cases as the present, it ought to be regarded as a symptom of cerebral and spinal irritation. We may indeed in this respect distinguish tetanic symptoms into two sorts or varieties, viz. cerebral tetanus or *trismus*, and spinal tetanus or *emprosthotonos* and *opisthotonos*. In the former case we are induced, by the most conclusive anatomico-physiological arguments, to believe that the irritation is most commonly seated in cerebral nerves. In the latter case, on the other hand, all the known facts collected by various credible authorities, and, above all, the arguments adduced in the learned and instructive commentary of Charles Speranza, Professor of Special Therapeutics and Clinical Medicine in the Ducal University of Parma, lead us to infer that the irritation is very generally seated in the roots, trunks, branches, or filaments of spinal nerves.* In the present case it appears to me to have indicated cerebral irritation, either directly, or indirectly, by exciting through the Vidian nerve the small or muscular portion of the fifth pair.

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[*] J. B. Palletta, de Nervis Crotaphitico et Buccinatorio, Mediolani, 1784.

A proof still more decided of the existence of cerebral irritation was afforded by the mental derangement which this young woman exhibited. This took place shortly after the appearance of the *trismus*, viz. on the 28th of June, and presented the usual characters which are observed in the excited forms of *meningitis*. These were greatly augmented muscular strength, much restlessness and sleeplessness, and even a reckless disregard to self-preservation, with much mental irritability. It is further a singular pathological fact, that, at this period, when the irritation seemed either to extend or be transferred to the brain, the palsy went off, and the patient recovered the use of the limbs. This, it must be allowed, looks more like metastasis than extension of morbid action, and seems to indicate that the congestive state which succeeded the irritation of the spine had passed, in its incipient, nascent, or irritative form, to the brain, or at least to its membranes, and was then the cause of the restlessness, sleeplessness, delirium, and other marks of mental derangement.

This state continued from the 28th of June to the 12th of July, when the acute delirium and sleeplessness went off, but was succeeded by a species of dogged sullen obstinacy and wilfulness, in which the patient would do nothing but what she chose, together with loss of power in the limbs, similar to that which she had previously presented. This, therefore, was neither a termination nor a solution of the disease, but rather another form of it. As for the two weeks from the 28th of June to the 12th July, it seemed to consist principally in an acute or subacute irritation of the cerebral membranes, so now when that affection had subsided, it appeared to assume the old character of chronic congestion of the brain and spinal chord, or investments. And it must be remembered, that during the whole of this period, the cerebral *trismus* or the irritation of the motor branch of the fifth pair continued.

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* Anno Clinico-Medico Compilato da Carlo Speranza Gia. I. R. Medico Provinciale nel Regno Lombardo Veneto, &c. Aggiunto un Commentario sul Tetano. Parma, 1825.

The latter order of symptoms continued about twenty days longer, or till the 4th of August. On the 1st of August, when I saw her with Mr Cockburn, she presented the symptom of sullen obstinacy and wilfulness, and required to be flattered and humoured like a child. The jaw was firmly fixed; the temporal and masseter muscles especially were rigid and hard; and the contraction of the buccinators gave a peculiar expression to the countenance. The senses of vision and hearing, however, were correct, and she was perfectly conscious of what was going on around her. She had no command over her limbs, especially those of the lower extremities; and required to be lifted and placed in the position in which she wished to be.

This state, however, was now giving way; and on the 4th of August she presented the first symptoms of mental self-possession, and at the same time began to feel that she had some command over the muscles of the lower extremities. This improvement might be justly regarded as the indication of a solution of the meningeal affection, both in the brain and spinal chord, the amendment in the mental faculties being the result of the subsidence of the morbid irritation in the former part of the nervous system, and the recovery of the command over the muscles of the lower extremities being the consequence of the abatement of the disorder in the spinal meninges and chord.

The progressive improvement in these two symptoms, the relaxation of the spasmodic closure of the temporal, *masseter*, and pterygoid muscles, and the subsequent appearance of the uterine secretion on the 8th of August, denoted the complete disappearance of the congested state of the cerebro-spinal meningeal vessels, and the consequent irritation of the nervous matter of the brain and spinal chord.

On the exact seat and extent of this Irritation, it is extremely difficult to specify any positive inferences. It appears, however, most consistent with the usual phenomena of nervous affections, and with the laws by which they are regulated, so far as these are known, to infer, that the irritative action was seated chiefly in the *meninges* or investments of the cerebro-spinal system, and did not penetrate to any depth in the substance of that system. My reasons for taking this view of the case are the following. *First*, the loss of motion was only temporary, and was confined to the lower extremities. Had the irritation affected the substance of the brain deeply, it would have produced permanent loss of motion, or an apoplectic seizure, with more or less affection of the external senses, and the memory and intellect. *Secondly*, another reason which seems to show that the disorder was confined to the membranes and the surface of the brain is the existence of delirium with *trismus*, rather than a comatose state, with relaxation of the muscles. From the phenomena of fever, *meningitis*, and similar disorders, in which we know that the morbid state is confined chiefly to the vessels of the membranes, it seems most reasonable to think that in the case of C. Ferguson, the disorder was in like manner seated chiefly in, if not confined to, the membranes. In short, there is reason to think from the symptoms presented, that they depended on a congested state of the vessels of the cerebral and spinal investments, irritating but not compressing the nervous matter.

I have in the foregoing remarks frequently employed the term Irritation, without perhaps attempting to define it with sufficient accuracy; and in extenuation of this, I might plead the usual example of pathological observers, who too often use this term in a great number of rather vague significations. It would take me much beyond the limits, within which I must confine these remarks, were I to enter into an inquiry, such as the subject deserves, to show the proper sense in which this term ought to be applied. I shall merely observe that by the term Irritation, as applied to the parts of the nervous system, is meant a state induced by *stimuli*, or irritants, mechanical, chemical, or physiological, in which the natural properties are unduly and unnaturally roused, yet without giving rise to the process of inflammation or the formation of morbid products, and consequently without destroying the compressibility, sensibility, and conducting and regulating powers of the nervous system. These powers are suspended and perverted, in consequence of the nervous matter being unduly and perhaps irregularly irritated or excited; and if the irritation were either so powerful, or so long continued, as to induce inflammation, it cannot be doubted, that morbid products would be formed, and that the organization of the affected part of the nervous system would be so much destroyed, as to be afterwards incapable of performing its proper functions.

In cases of the kind now under consideration, the irritation appears to have been partly mechanical, partly physiological. An usual quantity of blood within the vessels of the cerebral and spinal *meninges*, moving not with natural rapidity, in all probability from diminished reducent power in the veins, would give rise to all the symptoms under which the patient laboured so long and so successively. This undue quantity of blood, and its slow or impeded motion would undoubtedly constitute a mechanical species of irritation; but its action on the substance of the brain and spinal marrow, and the effects therein induced, must be physiological. In its operation, however, it is to be observed, that the peculiar, and, as I may term it, the pathognomonic character of irritation, is not to extinguish or abolish action, but to render it irregular,—to increase it above the normal standard in one respect, and bring it below that standard in another. Thus in the case of Christina Ferguson, while the levators of the jaw presented excessive action, the depressors and the muscles of the lower extremities generally presented diminished power. Of this irregularity we see daily examples in the case of diseases of the nervous system, and especially in the anomalous symptoms which they present. Sometimes even we find, as in cases of hysteria, a state of sopor or insensibility to external impressions, associated wtih the increased and irregular action of irritation.

Among other cases of this anomaly of action, I think the following, which came under my care within the last ten days, a useful example.

Alexander Dodds, a young man of 19, was brought to the Royal Infirmary about ten in the evening of the 18th August, in a state of insensibility to external impressions and presenting occasional attacks of convulsive motions of the muscles of the upper extremities, with rigidity of those of the body so complete, that he was carried by the head and heels without flexion of the trunk. The jaws were half closed, and the temporal and masseter muscles were rigid. Two persons who accompanied him, stated, that he had been found on the floor in a state of insensibility, with spasmodic contraction of all the voluntary muscles; and that he had been blooded to the extent of twenty-four ounces without relief.

The fits of convulsive motion came on by spastic drawing and contraction of the muscles of the superior extremities, which were extended involuntarily backwards and above the head with clenching of the fists. Then came spastic rigidity of the muscles of the trunk and lower extremities, drawing them also backwards, and rendering the whole body as rigid as a board. The muscles of the abdomen were hard and collected into masses; and the calves of the legs were drawn into hard knots. The lower jaw was not completely closed upon the upper, and remained apart about the sixth of an inch; but in that position it was firmly and immovably fixed. The tongue was completely paralysed.

Upon his admission twelve ounces more blood were drawn from the arm, upon which he became a little calmer, and the spasms seemed to undergo a little relaxation. A purgative enema was also administered, and brought away some dark-coloured excrement, but without affording much alleviation of the symptoms. The spasms, however, having recurred in an aggravated form, the head was shaved, fifteen leeches were applied, and four drops of croton oil were dropped through the teeth upon the tongue. Cold was also applied to the head, and sinapisms to the calves of the legs.

About an hour and a-half after the administration of the croton oil, vomiting came on, and he rejected much mucus and some portions of half-digested potatos, after which the spasmodic motions were less violent.

During the night he continued quite unconscious of what was going on around him, took neither food nor drink, and never spoke the greater part of the night, and was occasionally violently contorted by the spasmodic motions.

When I saw him next day at noon on the 19th August, he was still unconscious and insensible to external impressions. The eyes were forcibly and involuntarily drawn upwards, and the pupil, though large, was sensible to the stimulus of light. The countenance was flushed, the temporal arteries distended, and the jaws were firmly closed, with continuing hardness of the temporal and masseter muscles. The pulse was 80 to 96, tense and throbbing. The action of the heart was preternaturally strong, and its beat was performed with a clear strong bellows sound, and heard over the greater part of the chest. The chest sounded well, and respiration was natural.

While I was with him he had a very violent attack of the spasmodic motions, in which the arms and legs were writhed violently and irresistibly in the direction of flexion, and the whole trunk was incurvated upon itself. This was in short a fit of emprosthotonos, which lasted for about five minutes.

I directed twenty-five ounces of blood to be drawn from the arm, and if this did not moderate the motions, fifteen ounces to be drawn from the occipito-cervical region by means of cupping; the enemata to be repeated, and as soon as the jaw was capable of being relaxed, six grains of calomel with three drops of croton oil to be conveyed into the œsophagus; and a solution of six grains of antimony in four ounces of water was ordered to be given. Only fifteen ounces of blood were drawn from the arm, in consequence of some indications of faintness coming on, and the face being much paler. But the full amount was taken from the head by cupping, and the cold affusion was used. The bowels also had been once moved.

He spent a better night, and spoke once, and next day the pulse was down to 80, the countenance was natural, and the eyes obedient to the voluntary motions. He was in other respects in a state of quietism, but unconscious and with little sensibility to light, or other external impressions. There had been one attack of the spasm at half-past eleven P. M., but none afterwards. The jaw could be depressed, though not freely. The action of the heart was calmer, and free from the loud clear bellows sound. The most remarkable symptom, however, about this man was the complete loss of laryngeal voice. When he attempted to speak it was only in a whisper, and with the lips, tongue, and teeth, but not through the larynx.

He was ordered six grains of calomel, three grains of extract of colocynth, and three drops of croton oil, with the free administration of the antimonial solution of six grains to four ounces of water.

Next day he was completely conscious and sensible to all impressions, nor had there been any return of the spasmodic motions, and he could freely depress the lower jaw. The voice, however, was in the same state as before, and he could not speak unless in a whisper. He was ordered four ounces of the cathartic mixture.

On the 22d, he was completely conscious and sensible, but had not recovered the laryngeal voice, and answered questions slowly, as if from some impediment in speaking, with the lips, tongue, and teeth. The pulse was natural, and the tongue, which could now be protruded, was clean. Three motions had taken place. As some appetite had returned, he was allowed common diet. But as there was reason to believe that the want of the laryngeal voice was occasioned by some affection of the laryngeal nerves, I directed a large blister to be applied to the occipito-cervical region, and extending forward on each side of the neck. The colocynth pill was ordered to prevent accumulation.

Next day, on the 23d, when the blister had risen well, laryngeal voice began to return about seven hours after the first application of the blister. After this the voice became gradually natural; and under the use of laxative medicine to empty the bowels periodically, he quickly recovered his natural strength and appearance.

This case, in short, presented all the characters of some violent irritation of the nervous centres, and unless this had been removed by the prompt employment of efficient remedies, it must have gone on to fatal effusion, or terminated in chronic *meningitis* with insanity and palsy.

For this attack no cause could be assigned. The young man when he recovered his senses declared that he never before had any similar attack. He also stated, that it came on with acute pain of the forehead and temples; that then he lost recollection, and must have fallen down where he was found; and that he had no remembrance of any thing till he found himself in the Infirmary two days after. If the attack seemed like tetanus it must have been idiopathic; for careful inspection could trace no wound or injury adequate to produce so serious an affection. The patient, as a baker, was accustomed carrying heavy loads on the head; and this was believed by several gentlemen who saw the case, to be the most probable mode of accounting for the origin of the attack. On this, however, it is impossible to form any positive conclusion.

The complete loss of laryngeal voice was in this case a curious and important symptom. So far as could be discovered it could not depend upon the affection of any part of the larynx, but seemed rather to be induced by the state of the laryngeal nerves. The paralytic state of the tongue, the vomiting, the peculiar sound in the beat of the heart, and finally, the absence of laryngeal voice when he recovered consciousness, all indicated an affection of the organs of the tenth pair or pneumogastric nerves, and the glosso-pharyngeal; and perhaps the greatest degree of irritation, amounting almost to congestion, was seated in the membranes covering these nerves.

ART. X.—*Case of Punctured Wound of the Thorax.* By WILLIAM C. FOWLER, Member of the R. C. of Surgeons, London.

ON the evening of the 19th March 1834, in Charleston, South Carolina, Captain M'Kechnie of the "Margaret Millar," while in the act of lifting up his hat from the ground, had a poniard thrust into his chest, by a person behind him, between the fifth and sixth ribs of the right side, about an inch and a half from the sternum. Probably the state of fear in which Captain M'Kechnie was at the moment caused the lung to collapse, and thereby the instrument to pass without wounding that organ, between the *pleura pulmonalis* and *costalis*. A gush of blood immediately followed the withdrawal of the poniard; and before he arrived at Dr Waggoner's, the medical gentleman whom he first consulted, the hemorrhage was so profuse, that, as he himself expresses it, the blood was working out at the tops of his boots. Adhesive plaster was applied to the wound, and a bandage around the thorax; a laxative draught was desired to be taken at bed-time. Captain M'Kechnie then walked to his vessel, a distance of one mile, suffering but little pain from the wound,—the chief inconvenience being giddiness of the head, arising from the great loss of blood which he had just sustained.

At one o'clock of the following morning, when warm in bed, violent hemorrhage returned, when Dr Waggoner was sent for. The former dressings were immediately removed, the hemorrhage suppressed, and the wound bound up again in a similar manner. On the following evening he was attacked with acute pain in the wounded side, accompanied by rigors, flushing of the face, short dry cough, and other usual symptoms of *pleuritis*, or rather peripneumony with pleurisy. These were removed by a free use of the lancet, and some internal medicines, the nature of which he does not know.

Nothing else worthy of remark occurred previous to his sailing for Liverpool six days afterwards. After being three days at sea, a bloody serous discharge appeared, gradually, however, becoming more purulent, until the tenth day, when it was entirely purulent matter. On his arrival at Liverpool, after a passage of thirty-nine days, the daily discharge was from two to three gills. Although his general health had suffered considerably, he was able frequently to be on deck during the voyage, when nothing was done to the wound except keeping it clean, and applying adhesive plaster. The medical gentleman by whom he was attended at Liverpool wished to probe the wound, but was not permitted to do so. Tonics with generous regimen were administered, and different kinds of ointment applied to the wound.

About the end of May, his health having been considerably improved at Liverpool, although the discharge was still on the increase, he sailed for Quebec. During his passage to America, his health suffered so much that, although but 30 years of age, and of very plethoric habit, on his arrival at Quebec, he was quite emaciated. There it was proposed to lay open the thorax, for what purpose I do not know; but on introducing a probe, which they were able to do, 7½ inches, they abandoned the idea. At this time the daily discharge was from four to five gills of purulent matter. Some simple dressings were applied to the wound, and tonics with wine given internally.

He left Quebec for Belfast, where he arrived about the 1st of August. During the voyage he was confined to bed and the cabin. He remained in Belfast about two months; in course of which, he represents himself to have had a severe attack of liver complaint, for which I understand leeches and blisters were applied with other remedies, with considerable success. The medical gentleman, who now visited him, repeatedly attempted in vain to probe the wound; but could not introduce the instrument farther than the rib, or about an inch. A similar course of treatment to that which he had previously undergone he reports now to have been instituted; but his strength was daily becoming less, while the discharge of purulent matter was increasing at an alarming rate. He was therefore advised, if possible, to return to his friends, which he did about the end of September.

Next day I was called to see him, when he manifested the following symptoms. Great prostration of strength, perfect indifference to all kinds of food, very acute pain in the right hypochondriac region, with occasional rigors. The surface of the body, especially the face, was at one time red and flushed, at another pale and cold, and frequently bathed in profuse perspiration. He suffered from severe cough with free muco-purulent expectoration. The tongue was moist and rather clean. The pulse beat 125 in the minute. He suffered much during the night from unpleasant dreams, and the better he slept the more he perspired. The wound was 8¼ inches deep, as ascertained by a long probe. The daily discharge was upwards of 6½ gills of very dark fetid pus. There was no pain in the wound except at its orifice, which had been rendered very irritable by the frequent attempts lately made to introduce a probe.

It would be tedious to specify every particular connected with the treatment of this case, having occupied a period of nearly six months. The following brief statement will suffice. The patient was put on light nutritious diet. Sulphuric acid with quinine, as also various other tonic preparations, were given internally. His bowels, which were inclined to be relaxed, were restrained by the occasional use of astringents, as chalk mixture with tincture of catechu. Narcotics, especially the solution of muriate of morphia, were now and then, but as seldom as possible, employed. To relieve the pain in the right side, a few blue pills were given, and tartar emetic ointment freely rubbed over it. These, however, were of very little service; it being afterwards ascertained that the pain was produced chiefly by the weight of matter contained in the chest pressing upon the liver. Ammoniac mixture with squills and other expectorants were given for the cough; and a little corrosive sublimate, with red precipitate, was employed to enlarge the orifice of the wound, which was so small as scarcely to receive a probe the size of a crow's quill.

A long silver tube was introduced twice a-day to evacuate the matter, and on the first introduction not less than seven gills were drawn off. The fluid was very fetid and flaky. Six hours afterwards the pain in the hepatic region was very much relieved. Indeed, I found that the pain there was directly as the quantity of purulent matter contained in the chest was considerable.

The above treatment was pursued for the space of four weeks, but the patient's strength became more and more exhausted, and the discharge still more copious. The other symptoms were necessarily becoming more alarming; so that it was too evident, that, unless something else could be done, the case would soon terminate in death. I next thought of throwing astringent injections into it, but before doing so obtained the opinion of Mr Watt, who fully concurred in the treatment already specified, and also the plan of attempting injections. Tepid water was first injected, and afterwards a weak solution of alum. Tonics, as formerly mentioned, were constantly employed. During the following three weeks little benefit seemed to be derived from the injections, although they were varied and made daily stronger. The discharge had yet received no check, and so great was the cavity within, that after filling it up one day with warm water, there ran from it of purulent matter exactly twelve gills. At this time death appeared inevitable; his powers of body and mind seemed quite paralysed; he was literally drenched every night in colliquative sweats, and the hectic flush regularly crimsoned his collapsed cheeks. At this time I was frequently sent for during the night to see him expire.

By persevering, however, most unweariedly in the treatment just mentioned, and giving pretty largely but prudently of wine, the patient's strength began gradually to revive. The discharge began at last to abate, the cough to be more easy, and the defluxion less copious. The colliquative sweats and hectic flush disappeared; and although his convalescence was seriously interrupted by a severe attack of rheumatism, which was subdued by colchicum, on the 3d of March 1835, the stream which had so long flowed from the chest, in defiance of every kind of surgical treatment hitherto employed, dried up. In proof of Captain M'Kechnie's being perfectly cured, it need only be remarked, that he has since been twice at America commanding his own vessel.

Art. XI.—*History of a Case of Spectral Illusions with subsequent loss of memory of words and names, with the appearances on Dissection.* By James Craig, Esq., Surgeon, Ludgate Lodge, Ratho.

A gentleman, whom I shall designate as Mr N., distinguished for very superior mental endowments, and who had long, in a public capacity of great trust and importance, discharged with ability duties requiring great delicacy and address, as well as dignity and decision, withdrew from public life in the 77th year of his age, when he was still in the enjoyment of good health, and in the full possession of all his faculties. He had been early distinguished by great aptitude in acquiring the knowledge of languages, and he spoke ten and could read fourteen. He was most intimate with the Spanish. The Turkish, though he understood, he rarely spoke; and always employed the medium of an interpreter in his official intercourse with the natives of that government.

His habits had been always temperate, and even abstemious; for many years he had taken little or no wine; and, with the exception of flatulence and occasional palpitations, which were sometimes a source of uneasiness, he presented no symptoms of disordered health.

In the year 1819, when he was in the 76th year of his age, while his health was in the state now mentioned, he began to have almost daily visitations of spectral figures. These visitations were at first not constant but only occasional; but it was impossible to observe any connection between their recurrence and that of the hour of the day, or the state of the stomach, or nervous system. They in general presented human countenances and figures, with the head and upper parts of the person distinctly defined, but with the lower parts lost as it were in a shadowy mist. The figures were various; but he recognized the same countenances repeated from time to time. One very frequently repeated, after these visitations had continued for a few years, was the countenance of an elderly female with a brilliant eye, an expression arch and playful, and the appearance of being ready to address him. The dresses of the figures were various, viz. that of the ancient Romans, that of modern Europe of the age of Louis XIV., that of the Turks and modern Greeks, and, as in the case of the female figure already mentioned, the old-fashioned Scottish tartan plaid, drawn like a hood over the head and fastened beneath the chin, as was the custom observed by aged females in his younger days.

He could seldom recognize among the spectral figures, the person or countenance of any one whom he remembered to have seen, and in no case did he trace the resemblance of any departed friend. His own countenance, however, was occasionally presented to him, gradually undergoing the change from youth to manhood and from manhood to age. The figures appeared at various times of the day, both in the morning and evening. They continued for some time, and were seen equally well with the eyes shut or open, in daylight or in darkness. They were almost always of an agreeable character, and the gentleman courted their presence as a source of amusement. He had the power after some time of calling them up as it were, and he could banish them by drawing the hands over the eyes, or by shutting and opening the eyes, once or twice for a second or two. But on these occasions they often speedily reappeared.

The figures were sometimes as large as life, sometimes much smaller. But they were in all cases defined with the clearness and minute finishing of the finest painting. They sometimes appeared to be placed at a considerable distance, and gradually approached until they seemed to touch the face. At other times they floated from side to side, or disappeared, in the motion of ascending or descending.

In general the countenance of the spectral figure was presented; but on some occasions he beheld the back of the head both of males and females, exhibiting different varieties of wigs and head-dresses, particularly the flowing full-bottomed wig of the early part of the reign of George III.

From the time all these visions began to appear, Mr N. continued his practice of taking little or no wine; and he found that when he took any addition to the small proportion to which he restricted himself, the number and vivacity of the images was increased.

Upon one occasion, when he laboured under slight catarrh, and had taken a few drops of laudanum, the apartment appeared entirely filled with brilliant objects, as gold and silver ornaments and precious stones; but the spectral images were either not seen or were less distinct.

These spectral illusions continued to recur for a series of twelve years nearly as now described, with little change either in their characters or mode of appearance, or at the times at which they did recur.

After his retirement from public life, not only was his time most fully occupied, in carrying on endless alterations and improvements on his own property, but he took an active part in advancing all parochial matters. He became contractor for the parish roads, took delight in giving employment to the aged and infirm, and afforded his assistance and advice not only to private individuals, but was uniformly conspicuous in any object of public, and more particularly local, utility. On every occasion the utmost deference was paid to his opinion, which had not only the advantage of sound and matured judgment, but was recommended by the common-sense view which he took of every thing brought under his observation, with great suavity of manner. Besides this he had at his residence an unceasing round of visitors, as often foreigners as those of his friends at home.

After the accession of his present Majesty to the throne, Mr N. was invited to dine with the Knights of the Bath, for which purpose, in March 1831, he undertook a journey to London. At the same time he had in view the plan of effecting some arrangements with government, regarding the continuance of his pension, the threatened diminution of which gave him very considerable anxiety and uneasiness. He went by Glasgow to Liverpool to see the new railway, thence to Bath, where he got himself wet, and travelled twenty miles thereafter. This brought on a smart feverish attack, which confined him to bed in London for two or three days, but from which he soon recovered. He transacted his business, visited many of his old friends, and, with one day's rest in Yorkshire, posted from London homewards fully 100 miles a day having been absent only thirty-seven days.

It was at that time quite evident that his memory was much impaired. So far as names of individuals went, it was almost extinct. He knew by sight any one of his acquaintance quite well; their connections, their property, &c. &c. but could not name them. The names of plants also in his conservatory, which he was in the constant habit of showing to visitors, he had almost forgotten, and was so conscious of his defect, that he gave orders to his gardener never to be absent, but to attend any visitor in the conservatory.

From that, however, he in a great measure recovered, though not entirely, and again got engrossed in business at home.

When the cholera broke out in Scotland he changed his diet, and rigidly observed the rules then laid down by the Boards of Health. He avoided all vegetables, in which he formerly used to indulge; and his anxiety in the Local Board of Health to have every possible arrangement made, either for its prevention or mitigation, was most praiseworthy. Notwithstanding this, his laudable exertions were in another quarter viewed in an invidious light, and made the subject of severe animadversion; and that circumstance gave him so much mental uneasiness, that for ten or fourteen days he was very confused, dissatisfied, and even melancholy; and the circumstance as it was taken had a decided effect upon his mind. The offensive expression was, however, cancelled; and shortly afterwards the tenantry of the parish tendered him a vote of thanks, and requested him to present to his overseer a piece of plate for the very great improvement which had been, through his (Mr N.'s) instrumentality, effected on the parish roads. The heritors of the parish were to give him a dinner for his varied acts of usefulness in the parish; and about the same time he gained a law plea, the only one almost in which he ever was involved; and the joy caused by these combined events, immediately succeeded as they were by the preceding vexation, almost bordered on excitement. He called upon me on the 19th of August 1832, to talk about a local improvement, in which he was much interested, and I thought him particularly happy and well. I should say, indeed, that he was somewhat excited. On the same day he called upon a lady of his acquaintance, and told her that "he thought he was to be taken ill," and added, "that he hoped to bear his illness patiently."

On the 21st of August 1832, while sitting at dinner, (along with Mr F. and Mr L. E.) he was instantaneously deprived of the power to pronounce articulate language. He uttered sounds resembling those of a stammerer. With the exception, perhaps, of the muscles of speech, he did not appear to be in the slightest degree deficient in any other muscular power, nor evinced the slightest evidence of any other paralytic affection. His vision, which was rather imperfect, seemed most affected, the only evidence of which, however, was, that, in helping himself to wine, he poured it into his plate instead of the glass. He seemed perfectly conscious of every thing passing around him, and was either himself aware of his deprivation, or offended at the apparent surprise of the gentlemen who were with him. He rose from the table, seemed disconcerted, walked about the room with a steady step, and retired to his bed-chamber, where he shut himself up. In about an hour afterwards, he returned, talked quite well, but in a slower more studied tone than was his wont. As I was at this time unwell, he was visited by Dr M'Intosh and Mr Liston, who found him apparently well, but ordered some aperient medicine, and advised him to be kept quiet. On the 22d of August, he commenced writing a letter to the Secretary of the Post-Office, to complain about some irregularity in the delivery of his newspapers. Having, however, been interrupted by visitors whom he received, it was unfinished, and never forwarded. The overseer informed me that it was quite legible, but hardly in such a distinct hand as usual. He also told the overseer that he was afraid he was going to be taken ill, and requested his personal attendance. About the hour of dinner he was again seized in the same way, but in a worse degree; and the only English intelligible words he uttered were, without the least hesitation or stammering, showing the muscles of voice to be entire, "tenant" and "wine." This perhaps was to be accounted for, from the fact of the tenantry having tendered him a vote of thanks, &c. &c., as mentioned in the previous remarks. He was again visited by Dr M'Intosh and Mr Liston, who recommended laxative medicine.

During the following day (the 23d) he was much annoyed by an old foolish domestic, who expected, indeed was aware, that Mr N. was, in the event of his death preceding her's, to leave her an annuity. Of this she had the audacity to remind him, but his attempts to make some addition, as was believed, to the original sum, were perfectly fruitless. He could not write, and his use of the pen terminated in perfect scratches. He even seemed aware of his failing in that respect, for after renewed and repeated ineffectual efforts, he summoned his overseer and put him at the table, with paper, pen, and ink, and commenced dictation, which was utterly unintelligible. However, the overseer wrote, folded up and presented the letter to Mr N. who, having appeared to peruse it, was satisfied. He remained much in the same state, was visited by Dr Abercrombie, who had him cupped from the nape of the neck, ordered cooling applications to the head, and continued the opening medicines. I saw him first on the 24th along with Dr M'Intosh and Mr Liston. He talked almost constantly at that time. No intelligible English words, but "tenant," "wine," and "good wine," some Italian, French, and Spanish; but no subject could be traced. His tongue was clean; the pulse steady, and about 80; there was no unusual pain in the head; not the least paralytic affection; his bowels had been moved; he seemed to comprehend distinctly what was said to him; showed his tongue when asked; put out his hand when asked to feel his pulse; and was quite conscious of every thing which was said.

A blister was applied to the nape of the neck.

On the 28th, he was visited by Drs Thomson, Abercrombie, and M'Intosh, Mr Liston, and myself. We found him in every respect very much the same, and in consultation it was resolved, by mild but repeated aperients, to attend to the bowels, to maintain a free discharge of urine, to allow spare diet, and keep him very quiet.

He continued with very little change,—quite conscious of what was going on; understood most perfectly what was said to him; spoke in a variety of languages; and frequently, I am certain, used no known language at all, but merely a sort of gibberish, applying the very same sounds to persons, places, and things. Though he used principally the Spanish, in which he was a proficient, it was quite impossible to make sense of what he said. In one sentence you might recognize French, Italian, Spanish, but very rarely any English words. It may thus be remarked, that though he had the utmost facility in acquiring languages, this was the first of his failings.

On the 22d of September, during the night, he accidentally set fire to his bed, and, before it was discovered by his domestics, (for he always locked his bed-room-door during night, and neither argument nor persuasion would make him give over the practice which habit had established,) he had in vain attempted to extinguish the flame. When the door was forced open, it was with difficulty he was found, from the clouds of smoke in the room; but his butler rushed in and carried him out by force; and the bodily power shown in resisting the attempt was far greater than could well be believed. His head and hands were considerably scorched, and it was with no small difficulty that he was prevented from re-entering the room; but I believe that his anger at being forced out of the room, and his anxiety to return, arose from the fact, that the press containing all his valuable papers was behind the bed, though opening from an adjoining room, and of course that he was anxious to save them. Indeed, years previous to this he had authorized his overseer to break open and secure all the papers in that press at any time in case of fire. When told that the fire was extinguished, and no harm done, he remained in the ante-room quite composed, and was ultimately persuaded to go up stairs, but with much reluctance. Upon being told, however, that his wig was burnt, he looked quite surprised, and said in English, "it was impossible," walked down stairs afterwards, and found it himself, where he had previously laid it aside. He was entreated on this occasion not to lock his bed-room door, but without effect. At length he yielded to our requests, after telling him that, unless he did so, one of the servants must keep watch during night outside his windows. He in consequence of this left the door unlocked; but such was the force of habit, that he placed at the back of the door tables and chairs, books and other articles, which would offer more effectual opposition than any lock.

As he now used more English words in his conversation, and as it was natural to ascribe this temporary improvement to the effects of the derivation produced by the inflammation ensuing on the scorching of the head, it was thought advisable, in consultation with Dr M'Intosh and Mr Liston, to imitate this counter-irritation by applying a blister round the head, and keeping part of it open. This was accordingly done on the 26th, and it was kept open for some time afterwards. The whole blistered surface festered, from his constantly fingering it, and the discharge from it was most profuse. His bowels were daily acted upon; the secretion of urine also attended to; and the diet regulated, but with very little amendment.

In September he took an airing in the carriage on a Sunday, and I accompanied him. He drove directly to his farm, where immediately preceding his illness he intended to build a dwelling-house, and seemed surprised at not seeing the masons at work. I reminded him that it was Sunday, when he immediately pointed homewards, called at his lodge to inquire for a boy who was ill, in whom, as in every case of distress, he took a lively interest.

He was about this time visited by a Portuguese gentleman, who conversed with him in Spanish, which he spoke at first correctly, but afterwards occasionally mixed with other languages, and also seemed to jumble different subjects, or pass rapidly from one to another. He showed the same polite affability as usual, and requested "l'etranger" to get some refreshment, and to show him the grounds. He would not allow the blister to be kept long open; but if good was to follow its application, it might, from the profuseness of the discharge. He however, occasionally used more English words, talked in the feminine when he meant the masculine gender, and was much in the habit of addressing every one by the name of water. The footman he used to call "young water." The butler "old water." I on some occasions was called "knock-him-down,"—I suppose from being in the habit of giving any instructions regarding his medicine, his regimen, &c. If a doubt occurred, he would say, "wait till young knock-him-down come." People of rank he used to call "the king," "the queen," "the great man," "the grand vizier." Sir A * * M * * got the name of "the wayland king," or "the old great grand vizier;"—I suppose wayland from being convener of the C * * district of roads, which term was only applied when talking of the roads. He would occasionally mimic the manner, or show off any peculiarity in the personal appearance of individuals, when we did not seem to comprehend whom he meant. Knowing I had been to C * * he asked me thereafter how "the great big man was," and described with his hands the rotundity of an abdomen. I understood him to mean at once Sir R. P * *. In the same way I could not ascertain his wishes one day, when he put his fingers to his ears and hummed or buzzed like a bee. On examining his ears I found them full of wax, and syringed them, which relieved him.

About this time also (September 1832,) I was required by his agent to grant a certificate of his state, in order to make some arrangement with his banker, and the following was given.

"*27th Sept.* 1832.—I do hereby certify, upon soul and conscience, that * * * * * is at present unable to write, or to give such directions in the management of his affairs as may be understood.—(Signed) J. Craig."

This certificate was the more readily granted, because, though he had never attempted to write since the month of August, apparently satisfied that he could not, yet his hands had not recovered from the effect of the burn, which effectually prevented him writing. That he could not, a future trial proved.

A constant suspicion of almost every one seemed his greatest mental failing. When he had any thing to communicate to me he almost uniformly shut and locked the door, commenced his narration, which I always seemed to comprehend (though perhaps there was not a single intelligible word,) and frequently he used to slip on tiptoe to the door, open it quickly to see if any one was listening. This was frequently repeated during our conversation, and the same method he used to adopt with his agent, his overseer, &c. &c. To such a length did suspicion and dislike take possession of his mind regarding one of his domestics, that he would not even eat bread which had been toasted by him, but would rather toast it himself. No ground of such dislike was apparent to us; but he frequently and energetically expressed a strong wish to have him dismissed, and we believe that dishonesty was the fault which Mr N. attributed to him. When Mr N. was in London he had a number of sovereigns in his chaise box, which upon his return were put into his bed-room. Being in want of money he remembered the circumstance, had the box unlocked by his overseer, but no sovereigns were found. It was known that the box did contain sovereigns, and it is quite possible that Mr N. attached the suspicion to the said domestic. His jewels and other curiosities, of which he possessed a valuable collection, he had packed up,—part given in custody to a friend, and part he got packed up in a trunk, locked, tied down, sealed, and put in a secure place in his own house. His butler also got out of favour; but I happened to discover accidentally the cause. He frequently talked to me against him; when one day I ventured to speak favourably of him, he said "No, Sir, he squeezed me, he pressed me," and suited the action to the word. Recollecting the burning scene, I assured Mr N. that it was to save his life he acted so, which partly satisfied him, and the dislike has gradually to a certain degree worn off.

Perhaps the best way of illustrating his case farther would be to relate any anecdote which occurred to explain its peculiarities, and it appears the more necessary from the very general prevailing belief that Mr N. is insane. To myself who visited him almost daily it appeared most evident that his mind was not much affected. That it was quite entire, I am neither prepared to admit or deny. That he performed some actions quite at variance with the former tenor of his straight-forward and correct life, I admit most freely; but that these might have been done in consequence of the inability his domestics and others had to understand him, is more than probable from the examples which I shall adduce.

With regard to medical treatment little more was done than what has been mentioned. But he went out daily in the carriage for three or four hours, and for sometime the coachman had much difficulty in keeping the road Mr N. wished to go. He always told the driver something or other, when he went into the carriage, but almost uniformly quite unintelligibly, and at any cross road, when he found the driver did not understand him, he used to point. One day, in stepping into the carriage, he said in English, "Take me to the place I never was before." The driver went on, and after much difficulty Mr N. piloted him to the new bridge, across the Dean, which he had never seen. He used to pay the tolls and receive the change himself; nay, used to stop for a ticket to carry him through any other toll he intended in his drive to pass. It was most evident that the slightest irregularity of his bowels, or the occurrence of any circumstance which seemed to give him vexation or annoyance, had a decided effect upon his language. He talked much and uniformly more unintelligibly, passed most restless nights, and seemed to be annoyed with spectral illusions, (or a dread of robbers,) the impressions of which were so strong, that his repugnance to any one being in the room with him at night was altogether overcome, and he even seemed to dread going to bed. He frequently was in the habit of starting up during the night, crying "keep them off;" "they are coming," &c. &c. used then to get up and walk about the room, examine if the doors and windows were secure, and again retire to rest. One servant, in whom he had confidence, he allowed to sleep in the same bed-room, and another in an adjoining room; but he always had a knife or some weapon of defence placed by his bed side, and an implement (viz. an awl,) for a similar purpose at his own. Whether these precautions arose from ocular deception, or from distrust in the honesty of his other domestics and dread of robbery, is doubtful; because I regret to say he had ample grounds for suspicion on that head, and suffered much annoyance in consequence.

On one occasion, during the day, he had a visitation of a most remarkable spectral illusion. He imagined he saw the form of Mrs N. (who had been dead for several years) floating around the room, beckoning for him to follow, and ultimately appearing to depart at the window. The hallucination was so vivid, that he followed, jumped out at the window (a height of 7½ feet) and fell upon grass; but the fall did not dissipate the delusion. He rose, walked into the garden and conservatory, her frequent resort, where he met his overseer, and exclaimed "Did you see her? my own madame, my wife," and related the foregoing particulars, principally in English. Upon being reminded that she was dead, he was at once aroused from his waking dream, walked into the house, and avoided all mention of the subject thereafter. I inquired on the same day (with the view of getting him to speak upon it) if he still saw those visions which formerly used to attend him. His reply was, "Yes, magnifique, and sometimes not so brilliant." He avoided, however, all mention of the morning's illusion.

Previous to his illness he had put his name to a bill for L. 280. He recollected within a few days of the time it became due, seemed much distressed, and very restless, frequently had long conversations with his overseer, hardly a word of which could be understood. It was evident there was something he wanted. At length one day he got out in English, "I want a hundred, another hundred, and something less than a hundred." The bill at once occurred to the overseer who made mention of it, and stated how he had managed to answer the demand, which at once satisfied him.

There was an account also which, prior to his illness, he had promised to pay, and one day he searched over a number of papers, which were not arranged in the most regular order, took out the account, gave it to the overseer, but spoke in an unknown tongue. It was asked if he wished it paid, being aware of the preceding promise, and he answered, "To be sure." On one occasion he seemed much distressed about his hat, which had seen service. After much speaking, he managed to get a brush and a bottle of beer, went with these and his hat to the door, and brushed his hat upwards alternately with the dew and the beer—returned and said to his butler, "I told you it would look better; it will do yet." Upon another occasion he took a dislike to the bread, but his instructions could not be understood. He then drove to a baker's at C * * * and bought a loaf. Thence he went to town to another baker's, bought another loaf, came home, and asked his overseer which "he thought was best." Shortly after that, the servants sent to him the bread he formerly was in the habit of using; but he immediately detected the imposition by the smell, and he would not afterwards allow the proper loaf to be taken out of his room. Other purchases he made in like manner; but whenever his servants understood what he meant, he never repeated the purchases, but deputed one of them.

On one occasion he brought me the fragment of a bottle, and told me a long story, and, as he seemed more than usually anxious, I told him I could not possibly understand him, when he looked surprised and said, "How stupid you are, *N' importe*." After I left, he found the fragment with the label, went directly to an apothecary in town, presented it, got a fresh supply, paid it, received the change, and came home. Upon another occasion in January 1833, he wanted something, which we could not explain. He went to town to a bookseller's, where he searched about the counter until he got hold of an Almanac, paid for it, and came away. He showed it on his return home as the article he wanted.

Frequent similar occurrences happened at home, and when he could not make himself intelligible he used to go to the place where the article was, and get it himself. In this way he has gone to the cellar, to the press, &c.

In February 1833, he was most anxious to find out some one in town, who, after a long discourse, turned out to be Dr Davidson. On this occasion he put the Directory into my hand, and said, " Now find him." As he was complaining at the time of pain in his side, I mentioned several of the medical men in town, and whenever I mentioned Dr Davidson, he said, " Aye, that's he." " Where is he?" I gave him the address, which he gave the coachman, and went directly to town to Dr Davidson, whom he consulted; and whose account of the interview I subjoin.

" I recollect, distinctly, Mr N. calling upon me, and my being unable to comprehend what he said, his conversation being a mixture of German, Italian, French, and Spanish, with what I conceived to be Turkish, and gibberish spoken by no nation under the sun. I was completely puzzled, till I saw him rubbing his left side, which I recollected his doing when he had palpitation of the heart. He was pleased when I inquired about that symptom, and felt his pulse, informing him that I should prescribe a medicine which might give him relief. Mr Craig joined us, and Mr N. remained for some time talking in a manner unintelligible to both his medical advisers. When he was going away, I offered him my arm, but he refused assistance in descending the outer stair, saying, 'No, Sir, I cannot allow that,'—the only continuous sentence in English he pronounced during the whole interview."

In April 1833, the wife of a tenant died, and the news were communicated to him. He went to the funeral; and I would have defied the most accurate observer to detect the very slightest impropriety or omission. The grave was deep, and I wished him to retire, but he said, " He did not think it decent." After the grave was filled, he went to the widower, shook him by the hand, and in the most kindly manner said, " I feel much for your loss."

By this time it was quite evident there was a considerable amendment, both in his language and in his general appearance. He pursued the same invariable regularity with regard to diet and general regimen as formerly mentioned. He frequently visited some of his neighbours, and if any one called upon him, he uniformly returned the visit shortly thereafter. One day he said to me with tears in his eyes, and pointing to his head, "I am not all right here. They think I am an old, stupid, useless man, but I am not so stupid as they think me. I hope I'll yet get well." This was interlarded with many unintelligible words.

His memory was most decidedly improved, of which I had frequent and even trying evidence,—at least so far as the daily occurrences of ordinary life went. He forgot nothing; but his recollection of language was still very deficient, and the defect was aggravated by any thing which caused mental uneasiness, or disordered the alimentary function, as irregularity of the bowels, &c. One day he told a very long story, altogether unintelligible, and then asked in English, "If I would do it." I replied in the affirmative, and did not see him for some time, thinking he would forget it. The moment he saw me, however, his first interrogation was, "Well, have you done it?" At this I was puzzled, but accidentally discovered the subject to be the dishonesty of one of his servants, of which he seemed convinced, and wished me to investigate. When I assured him I had heard nothing against the youth, the suspicious dislike extended to me, and he said, "Well; you are one of them, too. I see you are all alike." After this he did not appear at all so well pleased for some time with my visits as formerly.

I observed that if he saw or visited any one whom he had not seen for a long time, he usually began in English, but soon lost it for some other unknown tongue. Surprise, such as the communication of distressing or unexpected intelligence, uniformly produced English; but anxiety, such as any subject he appeared to be thinking about, and wished to communicate, had an opposite effect. His nights were as usual most distressing and disturbed by, as we supposed, spectral illusions. As formerly, his servant was in the habit of reading the newspapers to him, sometimes a review, and on the Sundays some religious work, when he generally staid at home, in order to allow his servants to go to church. About this time it was evident that he meditated leaving home. He gave his star, the property of the Crown, and a valuable gold necklace, to a private friend, saying in English "It would be safe here," the only directions which could be understood, and which proves his want of confidence in his domestics. He packed up some clothes, gave long instructions to his overseer, and went to town, as we believed, to go to London He drove to the Royal Hotel, where he wished, what we supposed, post horses, but being quite unintelligible, he was thwarted in his intentions. He walked along several streets and returned. He was kept rather short in pocket money, and was annoyed at it; and we believed, from several random expressions, that he wished to go to London, to settle matters with government, thinking his pension was suspended, which at one time in reality happened. In July 1833, however, he went towards Glasgow, having stopped to feed his horses at West Craigs' Inn. He seemed pleased with the house, though it really had little in appearance to recommend it, and remained quietly for some time. He took his drive every day as usual, and passed most tranquil nights. If during his drive, the coachman went far in the direction of home, he immediately ordered him backwards. I visited him there and urged his return home, but could not prevail. After repeated requests he energetically said in English, "Good God, Sir, if you knew what I suffer at * * * you would not ask me to return." He went thence to Glasgow and Greenock, where he visited some old friends, paid his bills himself, the tolls, &c. and always gave a gratuity to the servants. At length he returned to * * *, and was more tranquil during the night ever after. For some days after his return he had several long interviews with his overseer, who could not understand him. At length he got a sheet of paper and commenced folding it up in the form of a letter, and had L. 4 in his hands. It was evident he wished to send it to some one. Upon a little inquiry it was found out that he had borrowed L. 4 from a gentleman in Glasgow, and upon being asked if he wished the money sent thither, he answered "That's what I've been telling you all along."

I had various conjectures regarding his wish to leave * * *—one, that he was harassed with ocular spectres during the night, in all likelihood (from his constant exclamations) of a frightful nature, or had lost all confidence and comfort in his domestics;—another, that he did not think himself improving so fast as he would wish, and thought of trying a change of scene, and this was likely to be the case, from the fact, that his servant having read sometime previously in the newspapers, that a change of air was recommended to Sir Walter Scott, which seemed at the time to make a considerable impression on his mind. Another conjecture was, that he wished to consult Dr King, whom he visited, but found an invalid.

Another calamity now awaited him. His vision, which had been imperfect for years, became much worse, and it was evident that he had incipient cataract. In other respects, however, he rather improved, when from home. He was in general more intelligible and passed more tranquil nights; and perhaps this improvement was to be ascribed to his sleeping in the drawing-room, which was more spacious than his own apartment.

A report having reached the ears of his bankers that he was stupid, and could understand nothing, a medical certificate was again required; and, in August 1833, Dr Davidson revisited him along with me, when, after a long and patient conversation with himself and examination of his servants, we granted the following certificate.

"We hereby certify, on soul and conscience, that * * * * * * is incapable of managing his affairs, from want of power to communicate to others his wishes and intentions, by having lost, for the present, the faculty of speaking distinctly, or writing intelligibly; and we also certify, that, after a minute examination of * * *, and careful inquiries about his conduct, habits and transactions, we do not consider that he labours under any morbid or unusual defect in his intellects, and that, consequently, he cannot be regarded or treated as insane or imbecile.—(Signed) H. DAVIDSON, J. CRAIG."

The opinion of Dr Davidson is given in his own language.

"As Mr N. was quite sane in action and conduct, and as he understood me perfectly, during a long conversation upon a variety of subjects, I could come to no other conclusion, than that he was completely *compos mentis*, and not a proper object for cognoscing, or any other legal interference with his liberty. Though, at first, I had much difficulty in comprehending his answers and spontaneous remarks, I came, by degrees, to make out what he meant, and the import of certain words, such as *wasser*, which was his term for *weather*, and *wacher*, by which he intended to express money, derived, perhaps, from *wucher*, which, in German, means usury. One word *gaudium*, served a variety of purposes, which I noticed to * * * who seemed surprised when I stated, that, from his not speaking English, or any single language, I had considerable difficulty in comprehending him. He endeavoured to explain the word *gaudium*, but unluckily, the language of his definition was more than usually replete with *baragouinage*. The longest sentence which he gave in unmixed English was, when I mentioned that he might get his man-servant to put on bandages for slight œdema in the limbs, he drew himself up, and said, with much emphasis, "Sir! any other person but that——"

"In the Eloges of Cuvier, it is mentioned that Broussonnet's memory of language was affected, in a very singular manner, by disease in the cerebral substance."

"Of one faculty no restoration took place. He was never able to pronounce or write accurately, substantive nouns and proper names either in French or Latin, though he had complete power over the other parts of these languages. Epithets and adjectives were presented in a mass, and he could in his conversation accumulate them in a manner sufficiently striking to make himself be understood. When he wished to designate any individual, he recalled his figure, his qualities, and his occupations. When he was speaking of a plant, he described its forms, and its colour. He recognized the name when it was pointed at by the finger in a book; but the name never spontaneously presented itself to his memory."

"Upon inspecting the head there was found at the surface of the brain on the left side a large ulcer, of which two-thirds were already cicatrized. This was probably the cause of his first illness, which was a slight attack of apoplexy, which would have terminated in complete cicatrization, if a new accident, namely, *coup de soleil*, had not ensued.—J. H. D."

It was Dr Davidson's perfect conviction that * * *'s case is altogether quite singular from his peculiar deficiencies, along with the almost entire condition of his mental faculties, which prevents all interposition similar to that which would properly take place were he either insane or imbecile.

From legal advice it was thought prudent and proper,

1st, To endeavour to get Mr N. to read in my presence, both printed text and manuscript.

2d, To get him to sign his name, having either the letters composing it, or the name in full before him.

To ascertain the preceding points, however, an insuperable difficulty arose. He had, as formerly mentioned, incipient cataract, and told me he saw very imperfectly. Mr Wishart, whom he also consulted, stated that there was cataract in both eyes, with well defined *arcus senilis*; but he was quite unable to give an opinion of what degree of vision he had, from being totally incapable of understanding what he said. I am quite certain, however, that on some days he saw much better than on others. He observed stones, rubbish, or any nuisance on the wayside, and failed not to complain of them being there. At an early part of his illness he gave his gardener a book, in which was the history of some American plants. At that time he must have enjoyed some degree of vision, as the article was the only one connected with horticulture, of many which the volume contained. When I put in his hand a book upside down, he at once placed it in its proper position, and pointed to the title-page, but I could not get him to read. Manuscript I am satisfied he could not read. A note announcing the death of a friend was put in his hands. He looked at the superscription, opened the note, and appeared to peruse it, but I am certain he did not even trace the outline. He folded it up, and said

"Of no consequence." I then told him its contents, which affected him much.

Again he wished money, and was annoyed at not receiving any. At length, when we understood his wishes, he got his overseer to write an order upon Coutts and Company, which was done, folded up and sealed; but instead of addressing it to Coutts and Company, the butler addressed it to Mr * * *. Mr N. examined the address, the seal, and said it would do. He took the letter himself to the Post-office in Edinburgh.

Again, at my own house, I added a border of only six inches breadth of grass, where grass was before, and to that extent curtailed the space where a carriage could turn in front of the door. He observed the alteration, and took notice of it; but then he took particular interest in any improvement, and I think observed things much better out of doors than within.

With regard to the second point, he was requested to sign a legal document. He made the first two letters of his Christian name very distinctly, and the first letter of his name, but no more, correctly. In many instances I observed the mental association or the thinking faculty to be quite correct, but the power of expressing it wrong. For instance, when examining a small house of really diminutive proportions, he remarked, "It is very neat, but a very little child."

Again, on a Sunday, he gave his coachman to understand to go to church, "but take one school," meaning one sermon, as he wished an airing in the afternoon. Again, talking of a very corpulent friend, who indulged in good living, he said "He is very stout—full, and a great guz—cure," evidently a combination of the word guzzler and epicure. I mentioned "You are of a different habit." "Yes, I am spare, and find it necessary." Again, he put an almanac into my hands one day, and asked me, "What o'clock it was?" instead of the day of the month, and this he did looking forward to the approaching term, when his servants' wages became due.

In March 1834, upon being told that his old friend Mr M * * * was making kind inquiries after him, he said in good English, "I remember him perfectly. He is very clever—good man, and I thank him for his kindness. He wrote a dictionary. I remember his book; very sensible, excellent man. I liked him much." Mr * * * had been a guest of Mr N. in Constantinople between thirty and forty years ago, and wrote a work on the topography of Troy, the MS. of which was submitted to Mr N.'s criticism.

From that time until May 1834, he went on without much variation, but decidedly improving. He took an interest in any local matter, as usual, though he never attended any public or parochial meeting; but upon being told of the decision of a matter personally affecting himself, he felt the ingratitude of the conclusion, and appeared to regard it really in its true colours. He had lately also a wish to commence to build his farm-house, which was stopped in consequence of his indisposition,—got the plans, and staked out the ground quite correctly. In proposing also to alter the approach to it, he pointed out the very line of road which was proposed two years before. He amused himself by carrying on improvements at * * *, and any alterations in the plans which he proposed were certainly improvements. He, moreover, executed an alteration in a line of road, corresponding to the very plan proposed by Mrs * * * and himself eight years ago.

At the commencement of the winter of 1835, his pulse, which was occasionally irregular, became greatly more so, and dropsical symptoms, as swelled extremities, liability to cold, and slight difficulty of breathing, ensued. Care, attention to the bowels, and mild diuretics, gave relief, though the dropsical symptoms returned on the slightest exposure.

In December 1835, he fell down stairs, was not observed at the time, and was found in the lobby in a state of insensibility. A cut across the occiput, which luckily divided a small branch of the occipital artery, in all probability, was a mean of saving him. He was put to bed, and soon recovered from the immediate effects of the accident, though it made a severe impression on his constitution, and hastened the progress of these symptoms which had so frequently shown themselves.

In March 1836, he awoke one morning and ordered breakfast for six, and after seeing the table prepared, expected his company; and when none arrived, his restlessness and irritability increased. He drove out as usual, but returned very unsettled, and the irritablity assumed the precise form of *delirium tremens*. He was on his feet walking about for thirty-six hours, imagining he heard people in various places in the room, under the carpet, &c. When he appeared to get exhausted, I gave him a large dose of muriate of morphia, and got him put to bed. He slept for eight or ten hours, awoke in his ordinary state. and took his drive as usual.

One morning, his servant read in the newspapers a paragraph stating, that Lord L * * * had undergone an operation for cataract with success. He marked the part, and kept the paper and showed me the paragraph. Mr Watson was consulted, who told him he could not advise the operation, which satisfied him.

In the first week of July, when out one day, he caught cold, which was followed by considerable fever, under the effect of which he laboured nine days, and gradually sunk, evincing to the last the same degree of sensibility he had done for years. Death took place on the 15th July 1836, in the 93d year of his age.

The body of Mr N. was examined on the 16th of July in presence of Dr Abercrombie, Mr Craig, Mr Flockhart, and Mr Comb.

In opening the head unusually strong adhesions were found between the *dura mater* and inner surface of the skull, which was removed with much difficulty. The portion of skull-cap which covered the right hemisphere was of moderate thickness; that which covered the left variable in thickness. Considerable effusion over the surface and between the convolutions of the brain, and great vascularity over the whole, indicating extensive chronic inflammatory action, especially in the course of the superior longitudinal sinus, where the *dura mater* was uncommonly thick.

The brain was examined by cutting thin slices from the surface downwards, commencing with the right hemisphere, which was found sound throughout, with the exception of a small tubercle, about the size of a split-pea near the surface, and similar to what is often seen in strumous children. The right ventricle was also sound. The left hemisphere was examined in a similar manner, and in the posterior lobe of the brain there was a cavity rather exceeding two inches in length, running obliquely outside of the left lateral ventricle, lined with a yellowish membrane, and the brain around its circumference was much softened. The cavity was close to, but not communicating with, the ventricle, which was sound.

The remaining part of the brain was then removed, and the base examined, which also over its whole extent bore strong marks of chronic inflammatory action. The internal carotids at the junction of the optic nerves were ossified. The base was then examined by cutting off slices. In the middle lobe, on the left side, a little behind the pituitary gland, and to the left of it, was a small diseased appearance, similar to what was in the posterior lobe, not exceeding a quarter of an inch in extent. No other diseased appearance except the increased vascularity was recognized.

The *cerebellum* was sound. On the posterior part of the *medulla oblongata* there was a small tubercle.

The thorax was opened. The right lung was found remarkably healthy; but the left lung adhering to the pleura. The substance of both lungs was quite sound. A good deal of fluid was effused both in the *pleura* and *pericardium*. The semilunar valves of the aorta were considerably ossified, and the *aorta ascendens* was enormously large, almost aneurismal, but sound in structure.

Pathological Observations on the foregoing Case, by DAVID CRAIGIE, M. D., &c.

The case now detailed presents a singular assemblage of symptoms, which it is by no means easy altogether to explain. Without the knowledge of the state of the brain and its investments, it must be at once rash and futile to attempt to reason on the probable cause of these symptoms; and even with the knowledge of the appearances found after death, great difficulties are presented to the formation of just ideas on the case. These appearances disclose only the ultimate effects of morbid action, while a thick veil is thrown over all the intermediate steps of the process, by which the commencements of disease are connected with the ultimate effects. By combining, however, the history of the case, and the changes which it underwent, with the appearances found in the brain after death, it may perhaps be practicable to form on it some useful conclusions.

The first question which naturally attracts attention is, what was the state of the brain causing the spectral illusions? In answering this, the principal facts by which we have to be guided, are the circumstances under which spectral images are seen generally, and the particular state of the brain and nervous system in the case of Mr N.

Spectral images are seen chiefly in three states of the system. 1*st*, Either when the stomach is disordered, and digestion has been more or less deranged; or 2*d*, when there is a congestive or irritative state of the cerebral membranes; or 3*d*, when both states are combined.

Though it has been long known that spectral illusions are liable to appear to persons in whom digestion is much impaired, as in hypochondriacal persons, and those living a secluded life, and perhaps with some corresponding, though temporary disorder in the circulation of the brain, there seems no great reason to believe that, in the case of Mr N., their appearance depended on derangement of the digestive functions alone. It is, indeed, true, that the slight derangement induced by taking wine, rendered these images more numerous and vivid; but it must be observed that the agent in this case operated not only on the gastric, but on the cerebro-meningeal circulation.

When we consider, on the other hand, that in the form of *meningitis*, or *encephalo-meningitis*, called brain fever, or *delirious tremens*, the appearance of spectral illusions is pretty common, we shall see reason to infer, that the occurrence of these images was, in the case of Mr N., connected with, and dependent upon, some peculiar state of the circulation of the brain and its membranes.

In confirmation of this view I would add the following facts, which, if carefully observed, are not very uncommon.

In the commencement, or in the course of plague, fever, and similar diseases, in which the sensorium is more or less disordered, it is not uncommon for patients to imagine that they behold spectres. Diemerbroek mentions, in the case of a servant girl labouring under plague, that the woman by whom she was attended, and who was in the habit of assisting the family in washing, had seen the person of the mistress of the family without the head, and who in consequence predicted her death. The lady, who was then at Utrecht, many miles off, died after some weeks of an attack of plague. The excitement and grief generally diffused at the period of the prevalence of the plague in Nimeguen, operating upon the nervous temperament of this woman, who was liable to spectral illusions, seem to have been the principal cause of this visitation. Diemerbroek mentions two similar examples occurring in persons otherwise healthy, but labouring under the influence of mental anxiety and distress.

Morgagni mentions the case of a scavenger or nightman, who, in the course of his nocturnal duties in some of the latrines of Padua, was very much frightened by an apparition, came home soon, and was severely ill and died. The disease under which he laboured was fever; and the apparition by which he had been visited was a hallucination or illusion presented to his imagination, while the circulation of the brain and its membranes was already disordered by the incipient stage of fever.

In *meningitis*, whether idiopathic or induced by gastric disorder, it is not uncommon for patients to have spectral images. A gentleman, who had an attack of this disease, induced partly by disorder of the digestive function, partly by mental vexation and excessive application to business, was firmly persuaded that the figure of a portrait which was hanging in his apartment was a living person, and even when he removed from the apartment, this figure was often presented to him. These recurrences of the figure did not cease till the disease was wholly subdued by active antiphlogistic measures.

Persons labouring under the preliminary, or irritative, or congestive stage of epilepsy or apoplexy are occasionally visited at certain hours daily by spectral images or illusions. Thus Sauvages mentions that he knew a young female who had an epileptic attack twice or three times in the course of the year, and who, previous to each paroxysm, dreamed much during sleep, and when awake had presented to her eyes frightful phantasms, and that after this she had no recollection of any thing; while her friends saw her start out of bed in a fright, and were obliged to restrain her from injuring herself.* Dr Gregory in like manner used to relate the case of a gentleman, who every day at or after dinner was visited by a figure which presented itself like the image of a hideous old woman, who came, as it were, to knock him on the head, and at whose approach he actually fell into a state of insensibility, which lasted for some time.

Of this cause of spectral illusions numerous examples might be adduced. But the subject has been so ably investigated by Dr Alderson,† Dr Ferriar,‡ and my learned friend Dr Hibbert,§ that it must be superfluous to dwell on it here. From the numerous facts adduced by these authors it cannot be doubted, that the occurrence of spectral illusions is, in a certain proportion of cases, connected with a morbid state of the cerebral or meningeal circulation. But as there is a class of cases in which there is either no disease of the brain or its circulation, or at least no permanent disease, the main difficulty consists in ascertaining what is the distinction between these cases and those in which there is, and in what manner are we to apply this distinction to the explanation of the phenomena of the case now under consideration.

It appears, in the *first* place, to be pretty clearly established, that such an affection has for its cause a morbid state of the circulation of the membranes, rather than of the brain, and that this morbid state may be short of inflammation, or, in other words, that it has not in all cases a tendency to produce effusion or such morbid products as would eventually interfere with the functions of the brain, or render the organ unfit to continue the life of the individual. This fact may be regarded as most thoroughly established, not only by the well-known case of Nicolai, the Berlin author and bookseller, but by the testimony of a number of similar cases given by Alderson, Ferriar, and Hibbert. The remarkable case of spectral delirium, especially recorded by Dr Alderson, may be regarded, with those given by Dr Sutton and Dr Armstrong, as quite conclusive on this point.

In the case now detailed, there is reason to believe, from the appearances found on inspecting the brain after death, that the occurrence of spectral illusions depended almost exclusively on an affection of the cerebral membranes. The unusually firm adhesion of the *dura mater* to the inner surface of the scull indicated some morbid action, probably of the nature of chronic inflammation; and this appears to have operated as a cause of irritation to the proper cerebral membranes, (*tunica arachnoidea* and *pia mater;*) since not only was the *pia mater* found particularly vascular, but a very considerable quantity of serous fluid was found effused into the subarachnoid tissue. The latter effusion must be regarded as the effect of congestion or injection of the *pia mater;* and though it is common to many cases in which there is no other proof of the congestive accumulation, it is quite clear, that when it is found associated with other appearances and symptoms, which during life indicated disorder of the meningeal circulation, it would be absurd to regard it in the present case as a mere pseudo-morbid appearance, or one which had taken place only after death. This congestive state of the *meninges* appears to have been diffused over the whole brain, as in the case of the form of *meningitis* termed *delirium tremens*, and seems to have occupied not only the upper part of the hemispheres, but their lateral and inferior regions.

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* Nosologia Methodica, Tome i. Ch. iv. xix. p. 579, Amstelodami, 1768.

† Medical and Surgical Journal, Vol. vi. p. 289. Ed. 1810.

‡ An Essay towards a theory of Apparitions by John Ferriar, M.D. London, 1813.

§ Sketches of the Philosophy of Apparitions. By Samuel Hibbert, M. D. F. R. S. E. 2d edition. Edinburgh, 1825.

But although the meningeal disorder was general and extensive, it appears, however, to have been in certain parts more intense than elsewhere, and in some parts particularly violent. Thus the *dura mater* was uncommonly thick along the course of the superior longitudinal sinus. It is not at all unlikely, that this was the region at which the morbid action began, and that from this point it progressively extended over the whole surface of the cerebral membranes.

There is in this subject, however, an important point for consideration and inquiry. The state of the membranes and brain recognized after death was merely an effect of morbid action; and it is not necessary to imagine that this state was really the cause of the spectral illusions. That indeed it was not the cause, must be inferred from the fact, that the state of the membranes could not have existed from the very first commencement of the phantom visitations, but must have been an ultimate and final phenomenon, which was the termination of a long train of morbid action. The spectral illusions began seventeen years previously, and continued for at least twelve years without being accompanied with any symptom of mental aberration or any symptom, in short, indicating incapacity to exercise the mental faculties. It is by no means likely, that the meningeal irritation or inflammation could have subsisted during the whole of that period, in the same intensity with which it was manifested during the latter years of life; and we therefore arrive at the conclusion, that the same cause, whatever it be, the same pathological essence was the cause of the spectral illusions, and of the morbid state of the cerebral membranes recognized after death. This cause it is not easy to define in exact terms; but, speaking anatomico-pathologically, there is every reason to believe, from the appearances found after death, and from the illustrations afforded by analogous cases, that it was a general excited or irritated state of the vessels of the cerebral membranes, producing in the brain a state analogous to dreaming. It must have been of the nature of vascular orgasm, or a state of the circulation in which the blood did not move freely through the capillary vessels of the *pia mater* and arachnoid membrane.

In illustration of this being the state of the meningeal circulation during the presence of spectral illusions, I could adduce, in addition to the facts already mentioned, many similar and to the same purpose. I shall content myself, however, with submitting, from the sixth volume of Hufeland's Journal, the following, which is not mentioned by any of the authors who have treated of this subject, and which has the advantage of furnishing a pointed illustration of the principle which I now wish to impress.

An intelligent person, of great worth and of literary habits, was sitting one evening in his chamber, in the apparent full enjoyment of corporeal and mental health, when the door seemed to be suddenly opened, and a person, whom he knew to be a friend, entered, walked into the middle of the room, and standing before him stared on him firmly. The gentleman rose to meet his visitor; but when he approached, the form of his friend vanished, and he then knew that it was a phantom. Soon after, however, the figure returned, and with it those of several persons known to the gentleman, all of whom, in the same manner, stared at him and flocked round him. This phantom assembly, in the course of a quarter of an hour, increased, with the addition of some figures, which the individual had not before seen, to such an extent, that the apartment could scarcely contain them. They jostled each other in different modes, they walked about, they gesticulated, some stood still, and at length they began to speak. It may be imagined that this situation was to the single unspiritual being in this apartment, in the highest degree unpleasant. He at length retired to his bed-chamber, in order to get rid of his importunate guests. It was, however, a vain expectation. The whole train glided in after him, thronged round his bed, and it was only with difficulty that he obtained a few hours of sleep.

Upon awaking, no long time elapsed, when one phantom guest after another again returned, and the whole assembly was as numerous and as persevering as the previous day. At length, this otherwise enlightened and unprejudiced person began to suffer from giddiness; and his being for ever surrounded by his singular and incessantly changing figures, even beholding them when addressed, deprived him at length of all mental peace, and of the power of thought, and threw him into a state of the most painful agitation. As the visitation was continued on the following day, he consulted his medical adviser on the subject.

It was discovered, that, about twelve months previously, at that very time, he had lost blood for symptoms of congestion in the head, and not unfrequently he had felt hemorrhoidal efforts. The application of leeches to the rectum was consequently recommended; which was accordingly carried into effect the same evening. Next morning, the assemblage of phantoms was already somewhat less numerous and tumultuous; and towards noon, it underwent a still greater diminution. In the afternoon only two figures were present, and in the evening, the patient recognized only one, which gradually became more indistinct, and at length entirely vanished. At the period of the communication (1798) no trace of such images was recognized.

This case I have detailed at large, because I regard it as extremely important in illustrating not only the pathological theory of spectral illusions generally, but that of the particular one now under consideration. What the case now detailed, indeed, was as an acute affection, that of Mr N. is as a chronic one; and so far as it is practicable to apply reasoning to cases of physiological and pathological phenomena, the state of the cerebro-meningeal circulation must have been nearly, if not wholly the same in both. It is indeed true, that, in the case of the German philosopher, the attack came on so suddenly, and gave rise to symptoms so urgent, that it necessarily called for some immediate therapeutic measures. In the case of the German philosopher also the images were more distinct, more complete, better defined, more animated and bustling. and altogether there were marks of a more vivid operation of the fancy. But, with these two exceptions, the cases appear to have been almost entirely alike.

In the case of the German philosopher, the collateral symptoms, the history of the case, and the effects of local blood-letting, showed that the presence of the illusions depended on congestion of the vessels of the brain and its membranes. It appears, therefore, a just conclusion to infer that, in the case of Mr N. a similar state of the cerebro-meningeal vessels took place.

I have already stated that there are good reasons for believing that this state is not, strictly speaking, inflammation; and assuredly the state of the brain causing spectral illusions is not necessarily connected with inflammation. Every thing, on the contrary, that we know concerning the occurrence of these images tends to show, that, though they may be associated with inflammation, yet in general they occur in states of the brain short of inflammation. When the true inflammatory state comes on, it extinguishes the tendency to form mere spectral images, and it produces delirium, or loss of memory and loss of judgment. The person, on the other hand, who labours under spectral illusions, does not necessarily lose either memory or judgment, and he may possess both in a very perfect degree. Again, while inflammation, acute, subacute, or chronic, runs its course, in a given time, and terminates either in complete madness, or fatuity, or death, the spectral illusions may continue for months or years, without terminating in any serious or conspicuous mental disorder, and without being attended with any new organic products in the contents of the head. Mr N. long preserved memory and judgment, was perfectly correct in every thing that he did, was aware that the figures which he saw were illusions, and enjoyed health as perfect as most persons at his years.

Another circumstance is further to be taken into account in forming a just idea of the pathology of spectral illusions. Not unfrequently they appear in states of the system in which peculiar and extreme weakness has been induced by copious losses of blood. Thus I once witnessed a very distressing case of spectral illusion ensuing on great loss of blood employed to check profuse *haemoptysis*, and which lasted at intervals for several days. Upon another occasion, a young married female of 25, who had lost more than forty ounces of blood at one blood-letting, in order to check a smart attack of puerperal *peritonitis*, had a very decided attack of spectral delirium, which was only removed by the use of a large dose of laudanum, and the application of cold to the head. In these cases it may be irritative or passive congestion, but it cannot be inflammation, which is the cause of the illusions.

It appears therefore to be a premature conclusion, that the occurrence of spectral illusions depends on the presence of inflammation, and especially on inflammation of the brain. I am aware that my friend Dr Hibbert has specified this state of the system as a source of these illusions;[*] and assuredly it is not quite impossible that illusions may occur, while the brain, or rather its membranes, are excited by the orgasm of inflammation, particularly at its commencement, or when it is declining. But I am not aware of any well authenticated instance in which genuine inflammation of the brain has given rise throughout its course to this symptom, or where this symptom could be justly traced to that cause alone. The cases which Dr Hibbert adduces from Dr Alderson's essay, and from Dr Armstrong, are evidently cases of the peculiar meningitic affection, denominated *delirium tremens*; and though the symptoms of this disease are often associated with inflammation, or rather irritation of the *meninges*, it may be argued, both from the phenomena of the disease, and also from its usual remedies, that this is not a uniform fact. At all events, I can distinguish between the vascular excitement taking place in the incipient or irritative stage of inflammation, and which appears to be that occurring in *delirium*

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[*] Sketches of the Philosophy of Apparitions. By Samuel Hibbert, M. D. F. R. S. E. 2d edition. Edinburgh, 1825, Part II. Chap. vi. and vii. 94 and 99.

tremens, and the peculiar orgasm of inflammation, which terminates in new products, and which tends, by the formation of these products, to render the brain unfit for its functions, and inadequate to the continuance of life. In the case detailed at the commencement of these remarks, the morbid process appears to have been rather of the nature of irritation, than of inflammation. It appears to have had little tendency to disorder the functions of the brain, and it may be justly doubted whether it had any influence in shortening the duration of life in the individual. If it be allowed, that certain cases of spectral illusion are connected with inflammation of the cerebral membranes, it must also be granted that there are other cases, in which this connection is not to be recognized.

Before quitting this subject entirely, I must advert to another point, bearing on the same question. The instance of the occurrence of spectral illusions in *delirium tremens* has been adduced; and undoubtedly that must be regarded as the strongest argument in favour of the proposition, that the existence of these phantasms is associated with the state of inflammation. It must be observed, however, that not only are the phantoms in *delirium tremens* different from those in the ordinary case of spectral illusions; but they are not constant, and are chiefly formed at one stage of the disease. In *delirium tremens* they are almost invariably of a hideous and alarming character; whereas in the other case they may be, and often are, perfectly agreeable, and without any thing frightful. In *delirium tremens* also they cease as the disease advances, and passes to the meningitic stage. Lastly, one of the strongest proofs of the correctness of the opinion, that the occurrence of spectral illusions may be quite independent of inflammation of the brain or its membranes, and depends on a pathological state less intense than that which takes place in *delirium tremens* or in insanity, is, that, in the two latter diseases, the patient believes implicitly in the real existence of the phantoms, whereas in ordinary cases of spectral illusions, as in that of Nicolai, Mr N. and the German philosopher mentioned by Hufeland, the individual is quite aware that these figures are imaginary and illusory. It is, in short, an important fact, both psychological and pathological, that the affection is so partial as to leave the judgment and consciousness in full energy to distinguish the illusory character of the images presented by that faculty, which our ignorance compels us to denominate Fancy.

This inquiry presents for investigation another point, which involves a most important question, and which might come to be considered in the management of the case. What is the difference between spectral illusions and mental derangement? and should the continuance of the former symptoms compel the physician to place the patient among the rank of the latter ?

At first sight many observers would at once consider a person who presented the symptoms of spectral illusions as quite insane, or at least mono-maniacal; and many insane persons doubtless present the symptoms of spectral illusions; and many have been on this account solely regarded as deranged. The ailment is, however, very different from insanity, and it may exist in full perfection, as in the cases detailed above, without any disorder or confusion of the judgment.

It was judiciously remarked by Dr Ferriar, that though "in certain diseases of the brain, such as delirium and insanity, spectral delusions take place, even during the space of many days, it has not been generally observed, a partial affection of the brain may exist which renders the patient liable to such imaginary impressions, either of sight or sound, without disordering his judgment or memory." The history of the illusions of Nicolai showed that this conclusion was perfectly well founded. That individual was quite conscious that the figures which were presented to his fancy were not real figures, had a perfect knowledge of his own state and of all other circumstances, and even retained an accurate remembrance of the sufferings which he had undergone, and formed a just opinion of the state in which he then was. This is not the case with an insane person, or even with an individual labouring under *delirium tremens*, both of whom believe implicitly in the reality of the phantoms presented to their disturbed imagination. The same principle was clearly illustrated by the case of Mr N. who for twelve years was liable to these spectral visitations; yet during the whole period, nay, even to the last, was quite conscious that they were illusions, and showed that his judgment was perfectly correct throughout the whole period. To the deficiency of memory which took place at a subsequent period, I shall afterwards advert. This circumstance, therefore, forms a striking and important distinction between the spectral illusions occurring in the course of *delirium tremens*, and mental derangement, and those which take place independent of these affections. In the former, the patient is not aware that the phantoms are illusory, and believes implicitly in their existence. In the latter, he knows that they are illusory, and treats them and acts accordingly.

Of this difference I further think we may find a satisfactory explanation in the anatomico-pathological distinctions, which I have already attempted to establish. In the case of *delirium tremens* and mental derangement, whether depending on an attack of *meningitis* or not, very generally, if not universally, the membranes, or the brain itself, present in their anatomical and physical characters some change or changes which exercise a decided influence on the functions of the organ. Thus in *delirium tremens* the *pia mater* is generally much injected, serous fluid is effused more or less copiously into the subarachnoid filamentous tissue, and the convolutions are often flattened, sometimes atrophied or shrunk; and very generally, also serous fluid is effused within the lateral ventricles. In *mania* also, in addition to these changes, it is not uncommon to find part of the brain indurated or softened, especially if there be any paralytic affection; and often there are indications of chronic inflammation of the membranes, as much thickening, &c. In ordinary cases of spectral illusions, it is not usual to find these or similar changes; and though some of them were observed in the inspection of the brain of Mr N. these I have now to show must be attributed to another cause.

It has been already remarked, that, in the case of Mr N. the spectral illusions continued for about twelve years, without being accompanied with any other serious change in the functions of thought or intellect. At length, however, memory began to be enfeebled in 1831; and it is important to observe the particular manner in which this faculty was impaired. It appears to have been principally, if not solely, in the memory of names that the faculty gave way. Persons, places and objects he remembered perfectly, and could describe them by their prominent characters; but their specific appellations or proper names he could no longer recall to recollection. Even this loss, however, was only temporary; for he recovered some degree of memory; and it was not till the subsequent year, about sixteen months after the first indication of impaired memory, that he presented decided and unequivocal symptoms of remarkable incapacity to remember appellatives and proper names, and along with this, some want of command over the muscles of articulate speech.

The explanation of this occurrence, and of the symptoms which took place on the 21st of August 1832, I think is to be found in the state of the posterior lobe of the right hemisphere, as disclosed by inspection. It is clear that, whether the orgasm which had terminated in this process of softening took place suddenly or slowly, it did not co-exist with the spectral illusions, nor could it have taken place within a few months or even days before the fatal termination. Every thing, on the contrary, in the case, concurs to show that at this time, perhaps some months previously, for instance in May 1831, a degree of vascular orgasm and excitation had commenced in this part of the brain; that after going on for some time it had undergone a temporary abatement; that it had given rise to the loss of memory then remarked; and that, after the first abatement, it had recurred in a more decided form in August 1832.

In this attack there were two remarkable circumstances. The first is, that the attack of loss of speech was momentary only; for Mr N. after retiring to his own chamber, returned in the course of an hour, and spoke articulately but more deliberately than formerly. The other circumstance is, that, with the exception of the muscles of speech, there was no indication of any paralytic affection, and equally little of any mental privation. He retained his consciousness and self-possession, was perfectly sensible to all external impressions so far as the brain was concerned, for his inability to see arose from the mechanical impediment of the opaque lens in both eyes, and was quite capable of recognizing his friends, and expressing satisfaction or dislike at those around him.

The return of the power of speech further shows, that the privation in that faculty did not depend on an affection of the nerves subservient to these muscles, as is the case in paralytic patients, but in a greater degree, if not altogether, on some lesion in the faculty of remembering and distinguishing the proper words to be employed. The progressive failure after this period of the memory of appellatives, proper names, and similar words, and the confused manner in which he afterwards applied such words as his recollection could retain, showed that the orgasm, whatever it might be, was slowly but certainly destroying the structure of a portion of the brain, the healthy state of which must be indispensably necessary to the sound exercise of the memory of appellatives and proper names. The only part of the brain disorganized sufficiently to account for the deficiency was the posterior lobe of the left hemisphere, in which it was observed there was "a cavity exceeding two inches in length, running obliquely inside of the left ventricle, lined by a yellowish membrane, and with the surrounding portion of the brain much softened."

It is still a singular circumstance that this lesion had given rise to no paralytic symptom; for there are recorded cases in which these symptoms were associated with a similar lesion in the same region, so far as a comparative estimate can be formed. As the present case, however, shows that this portion of the brain may be destroyed without impairing the action of the voluntary muscles, unless we allow that the inarticulate and stammering utterance was an indication of this lesion, it must be inferred, that the paralytic symptoms in similar cases depended not on the part destroyed and softened, but on the vascular irritation having extended to some adjoining portion containing the origins of locomotive nerves.

The peculiar form which in this case the privation of recollection assumed is, however, the most important feature both in a psychological and a pathological point of view. It is manifest, that the privation was not universal, as it did not extend to the remembrance of places, persons, or objects. It was restricted to the inability to recall at will appellatives and proper names only; and in the phenomena of this privation, we are taught a most important lesson regarding the utility and necessity of this class of words. As each appellative is a short conventional method of designating objects with many properties, and consequently implies a species of mental abstraction and distinction; its possession saves a great deal of time and trouble in the communication of thought and desires; and without its possession, or when it is in any degree impaired, the communication of these thoughts and wishes becomes extremely difficult, and may be even impracticable. A correct estimate of the nature and uses of this faculty can only be formed by comparing the name of any animal, plant, or mineral, with the long, circuitous, and not unfrequently imperfect and unintelligible process employed by naturalists in describing the characters of either of these objects. In the case of an animal or plant newly discovered or hitherto seen only by the describer, we know that it is almost impossible to convey a correct idea of the object without a specimen of it. But when it has been once seen and the name applied, the assemblage of properties of which this name is the abstract or general appellative, readily recalls the name, which then becomes a short and convenient representative of all these properties. It is manifest, however, that in this process there is a mental effort of distinction and generalization as well as of recollection. Of this, the case of Broussonet, quoted by Dr Davidson, is a remarkable illustration.

The privation in the case of Mr N. appears to have been one as much of the power of distinction and abstraction as of the mere memory of appellatives. His memory and previous knowledge provided him with many names and words; but none were the appropriate designations. Though Mr N. possessed the knowledge of many conventional terms representing the same object, yet he had no longer the faculty of selecting the proper ones, or arranging them in the proper manner. Thus he seemed to be perfectly unaware, in the ordinary state of his mind and feelings, that he was not speaking his native language, equally unaware that he occasionally spoke the Spanish language, not less unconscious that he very frequently introduced in the same sentence, Spanish, Italian, German, and English words, and completely unconscious that, upon certain occasions, he uttered words which did not belong to any language, either written or spoken. All these phenomena indicated, not simply loss of the memory of appellative terms, but either loss or very great diminution of the power of distinguishing and selecting proper terms, and of distinguishing the representative of any individual or object in one language, from the representative of the same object in another language. It is further to be observed, that this inability to distinguish the terms and the verbal representatives of thoughts in the different languages was not confined to appellatives, but extended to verbs and other words; and this fact proves most unequivocally, that it was not mere memory of language, but the power of distinguishing and selecting which was deficient.

Nor was this want of distinction or selection at all times the same. On certain occasions, as when the feelings were strongly excited, or when he was suddenly surprised, or when he was roused to make an effort, Mr N. spoke English distinctly and accurately; but he seemed quite unable to persevere in this for any time, and he gradually relapsed into the confused mode of expressing himself in outlandish words.

These facts and considerations appear to me to render it quite impossible to conclude that in this remarkable case there was lesion of a single faculty only, viz. the memory of mere language, as has been supposed. That the recollection of words was impaired cannot be denied. But as there was no lesion of any other form of memory, and as the deficiency in speaking evidently depended, not only on deficient recollection, but on inability to distinguish and select the proper terms, I think it must be admitted that there was rather a slight lesion of several faculties, than a general or great lesion of one.

It must not be imagined, however, that the lesion now mentioned was any indication of mental derangement. I have already shown that the occurrence of the spectral illusions could by no means be regarded as a proof of mental derangement or intellectual weakness of any kind, since in the case of Mr N. he was quite conscious that the phantoms were illusions, whereas the insane person believes firmly in the real existence of the images presented to his disturbed fancy. This consciousness of the illusory character of these images continued to the last, and Mr N. gave no indication, unless in the single instance of the apparition of his wife, that he believed them to be real, and this also his judgment afterwards convinced him was an illusion. It appears that the subsequent loss of the power of distinguishing, selecting, and recalling at will proper terms and designations, is equally little to be regarded as a proof of intellectual weakness or disorder. On all points, even after this attack, so far as the imperfect utterance and the inability to communicate his thoughts and wishes could allow Dr Davidson and Mr Craig to judge, Mr N. conducted himself with perfect propriety and consistency, and seems to have adhered to his early habits to the last. As to the indications of dislike and suspicion shown regarding several of his servants, it is manifest that the feeling was not entirely causeless; and many persons who exhibit the same dislike and suspicion of particular individuals, are never thought to be mentally wrong, and are observed to conduct themselves with perfect correctness in all the usual transactions of life. Even in the circumstance, that Mr N. was conscious that there was something not right within the head, while he was still unable to speak distinctly and uniformly in one language, there was proof that the judgment was still unimpaired.

With regard to treatment, it is important, before quitting this subject, to observe, that the extreme and habitual delicacy of the patient prevented him from making the occurrence of the spectral illusions a subject of communication to any physician for the purpose of relief. In truth, Mr Craig could never persuade him to speak explicitly of his visitations; and when Mr Craig showed that he was aware of the circumstance, Mr N. seemed to avoid the subject, and begged him not to mention it. It was chiefly in conversation with a medical friend, with whom he was on a very familiar footing, and whose premature death since, all who knew him deplored, that he was induced to disclose so much as was generally known regarding his case. To Dr Davidson also he spoke of them, but never seemed to think that it was requisite to apply for medical assistance. On this account little or nothing was done for the mere spectral illusions.

At the period when he was suddenly deprived of the power of articulate speech it was the belief of Mr Craig, that either one or more minute vessels had given way in the part of the brain afterwards found softened, or that, in this region, after being the seat of slight inflammation for a short time, effusion had taken place.

Art. XII.—*On Scarlet Fever, as it prevailed epidemically in Edinburgh, during the autumn and winter of* 1835–36. By James Stark, M. D. one of the Medical Officers of the Edinburgh North-Western Dispensary.

The autumn of 1835 set in with cold rainy weather, which continued with few intermissions the greater part of that period. In the latter part of the summer months and beginning of the autumnal, diarrhœas and dysenteries prevailed to a great extent, and many fatal cases occurred, as well amongst children as adults. Sore throats and *scarlatina* succeeded these complaints. The first cases I witnessed occurred about the latter end of September. It was not confined to any particular district of the town, nor to any particular rank of life, though, generally speaking, it raged with the greatest violence in those close confined situations, where numbers are crowded together in small apartments, in which, from the want of ventilation, and other means to prevent its extension from one member of the family to another, all the younger individuals were usually attacked with the disease. In some instances the elder members of the family were also affected.

In the same family the duration and also the severity of the disease varied much. The three forms of the disease, *Scarlatina simplex*, *Scarlatina anginosa*, and *Scarlatina maligna*, have in many cases been witnessed in as many members of one family. Whilst one has had the disease so mild as scarcely to confine the patient to bed, another has died of the disease on the third or fourth day of attack,—or has only made a lingering recovery, after life had been almost despaired of.

During the prevalence of scarlet fever amongst children, a similar affection of the throat prevailed to a great extent amongst adults. In many cases this appeared in the adult members of the same family, during, or immediately subsequent, to its prevalence amongst the younger branches. In many cases, however, no such connection could be traced. Isolated instances of the same affection occurred in individuals who had no communication with others labouring under a similar disease, or with *scarlatina*; but in none of the instances of the latter class was the disease communicated to others with whom they had intercourse, though the symptoms differed in no respect from those which happened in *scarlatina* itself.

In all these, the affection of the throat was precisely similar to that which occurs in the *Scarlatina anginosa*. Frequently it was attended with slight febrile symptoms; though more frequently the sole complaint was difficulty of swallowing and pain in the throat. The tongue, however, in all cases, manifested the same peculiar and characteristic fur, with the elevated red elongated *papillæ* projecting through it, and frequently with the red stripe along its margins. The *fauces* and tonsils were generally highly inflamed, with more or less swelling, which had a great tendency to run to ulceration, but in no case ended in the formation of abscesses. In several cases, there was a troublesome collection of mucus in the posterior *fauces* and windpipe. The difficulty of swallowing was usually great, from the pain caused by the stretching of the inflamed parts, more than from actual closure of the aperture of the posterior *fauces* from swelling, for this was in general not very considerable. In all those cases which seemed to have resulted from the contagion of *scarlatina*, the stomach was in a more or less irritable state; and in a few cases this condition remained for a considerable time after recovery from all affection of the throat. They presented, indeed, all the usual appearance of convalescents from a febrile disease. In others, however, the affection of the throat was so entirely local, that, excepting the difficulty experienced in swallowing food for a few days, no other inconvenience resulted. In the same order of cases, the appetite and pulse generally remained unaffected throughout. In one case which fell under my notice, the affection was chiefly confined to the *uvula*, which rapidly swelled to such an extent as to excite serious apprehensions of suffocation. Its surface presented a few ulcerated specks, and the tongue had the peculiar elongated red papillæ, with a red stripe down each side. The glands of the neck were also slightly affected. Scarification and repeated applications of the solution of nitrate of silver, with antimonials, &c. removed the complaint. This person had been exposed to the contagion of scarlet fever.

In another remarkable instance, one side of the throat alone was affected. In this case there was no fever, but general irritability. Notwithstanding appropriate treatment, ulceration proceeded to a considerable extent, confined, however, to the right side. The swelling was inconsiderable, but there was acute pain in swallowing, and some swelling of glands on that side of the neck. What was most remarkable in this case was, that the *right side* of the tongue from the mesial line was alone affected. The right half of the tongue was covered with a whitish coloured fur, through which appeared elongated papillæ, and a dark red stripe ran along its right margin; the left side of the tongue remained throughout of its usual healthy aspect. The obstinacy of the ulceration in this case depended on the circumstance, that, as the patient's health remained unaffected, and his appetite was to a considerable extent unimpaired, he could not be prevailed on at first to confine himself to the house, or take any medicines internally. It soon healed, however, when he submitted to confinement and low diet, with the use of aperient medicines. This person had likewise been exposed to the contagion of *scarlatina*.

These affections of the throat seemed to be intimately connected with the peculiar unknown atmospherical state which favours the epidemical ravages of *scarlatina*, and in many cases, as above mentioned, appeared to have been received from the contagion of *scarlatina* itself.

I met with six cases of a similar affection in children; but in all of them it was apparent that this affection was only a modification of the true *scarlatina*, inasmuch as they occurred in families, the other members of which were labouring under that disease. The febrile symptoms were equally severe, though not followed or accompanied by any efflorescence; and a still stronger proof that this was merely a modification of scarlet fever was observed at a later period of the disease. After convalescence was established, œdematous swellings supervened in three of these cases, and in a fourth, the urine was entirely suppressed, with rapidly increasing œdema, coma, and death in forty-eight hours, after the child was first observed to complain.

Dr Willan has stated, that whilst *scarlatina* rages epidemically, this peculiar affection of the throat frequently appears, but is confined to adults; and the same observation has been made by other writers on this disease. In the six cases noticed by me, there was no reason to doubt that it was merely a variety of the true *scarlatina.* None of the internal organs appeared to suffer more than usual, from the want of the efflorescence on the skin, though certainly a far greater proportion were afterwards attacked with œdematous swellings. These cases were all observed during the latter end of autumn, at which time the œdematous sequelæ were much more common than afterwards. While the epidemic prevailed during the period above-mentioned, all the varied forms of this disease were observed. Perhaps the most common order of cases was the *simplex*, or the mildest form of the anginose variety; in rare cases proceeding to ulceration, and this merely where the requisite attention to the throat had been neglected in the first instance. When seen early, such cases easily and quickly recovered. In these the febrile symptoms were rarely so intense as to require blood-letting; and they were in general successfully relieved by means of moderate purging, and tepid sponging of the surface, with an astringent gargle for the throat, if required. The best application for the throat, when the inflammation was at all severe, was the nitrate of silver in the solid state, rubbed over the affected parts, or its solution. Where there was merely inflammation, with some slight swelling, I found powdered alum equally effectual, and not less easy of application. This remedy possesses the peculiar advantage, that it leaves a pleasant coolness in the mouth, with a far from disagreeable feeling or taste; a matter of no small importance with children, who are but too apt to refuse all medicines from their nauseous taste. The application of powdered alum, indeed, is frequently solicited by the child, after it has felt the relief obtained by the first application; and the only inconvenience arises when too great a quantity is applied, from its being carried down to the stomach, and causing unpleasant symptoms. The mode of application is in itself simple. The point of the forefinger, a camel's hair pencil or feather, slightly moistened, is dipped in the powder, and applied directly to the affected parts. This may be repeated as often as is necessary. I have rarely in the case of children directed the use of gargles, as, besides the difficulty of the application, they but imperfectly reach the parts affected; and in more severe cases, from the attendant swelling of the glands of the neck, the head cannot be thrown so far back as to insure the application to the parts affected.

The anginose variety of this disease in its severer forms was far from unfrequent. In such cases the attack was more sudden, and the fever frequently ran high. In several cases I have even seen delirium. The posterior fauces had a dark red appearance, and white specks soon appeared, and rapidly proceeded to ulceration. The swelling was often very considerable, and the pain great. Troublesome collections of mucus took place in the posterior *fauces* and windpipe, which caused great annoyance, and in several instances a bronchitic affection attended the disease. The efflorescence was in several very severe cases confined to the neck and breast; in others the efflorescence appeared over the whole body, and never failed to alleviate considerably all the symptoms. I only met with three cases where there was a distinct papular eruption accompanying it, very perceptible both to the sight and touch.

When such cases were seen early, during the febrile stage preceding the eruption, or immediately on its appearance, the most successful practice was found to be abstraction of blood from the arm, carried so far as to relax the system; a practice to which my attention was first directed by a paper in the 44th vol. of Ed. Med. and Surg. Journal, by Dr Dewar of Dunfermline. This if had recourse to at the proper period, rarely failed to render it a mild and tractable disease. The inflammation of the throat rapidly abated, and if any specks existed, they gave no more trouble, after being touched with nitrate of silver. All that was otherwise required was to regulate the bowels and keep the patient cool.

When this practice was not had recourse to, or where the disease had gone on for some days before being seen, the ulcerations of the throat were often very troublesome, and the glands of the neck in the vicinity frequently swelled to a considerable extent. These causes tended to keep up the febrile action; and it was occasionally found impossible to get any medicines to act upon the bowels. In such cases a few leeches to the throat, or a small general bleeding (for it was not judged safe at this period of the disease to abstract a large quantity of blood) facilitated the action of the medicines, and reduced the febrile heat more effectually than cold sponging or any other means. In many such cases, however, it was necessary, in addition, to exhibit occasional emetics, in order to remove the accumulations of mucus in the posterior fauces and windpipe. The stomach appeared to be frequently in such a torpid state, that the ordinary ipecacuan emetic did not act, and to insure its operation more effectually a few grains of sulphate of zinc were added. During the whole course of the disease the bowels required the most unremitting attention. Purgative medicines required daily to be administered; and as in many cases during the severity of the symptoms ordinary doses failed to have the slightest effect, a combination of purgatives was required to be administered at intervals, till the desired effect was produced. Cold or tepid sponging was of the highest utility, as long as there were any febrile symptoms present, or any increased heat of surface, with quick pulse and general restlessness. The throat in these cases required to be daily inspected; and what proved the best application to the ulceration was a solution of nitrate of silver applied daily by means of a camel's hair pencil, or the solid nitrate rubbed over the ulcerated surface.

I have twice through the imprudence of parents nearly lost children by their administering spirits, or other stimulants, with the view of bringing out or keeping out the efflorescence, and heaping on clothes for fear of cold. The bad effects were in both cases arrested by blood-letting, cold sponging, removing the unnecessary clothes, and giving free laxatives, with antimonials.

Very few cases of the malignant form came under my notice. In those which I witnessed, the invasion of the disease was sudden, accompanied with much irritability of the stomach, incessant retching and vomiting, with great and sudden prostration of strength. Where the symptoms were not moderated at the outset of the disease, delirium and stupor rapidly supervened; the petechiae and *vibices* were large and numerous; the efflorescence of a dark purple hue, confined chiefly to the trunk of the body; and in one case the impressions of the fingers were followed by a bloody stain, as occurs in *purpura hemorrhagica*. In all cases, the throat proceeded rapidly to ulceration, and sloughing of a very intractable nature; the glands of the neck soon became affected; sordes were deposited on the teeth; and fetid purulent mucus distilled from the nostrils. The pulse, which from the beginning had a peculiar compressibility, became imperceptible at the wrist, and in one case death took place on the sixth day of the disease. Those who did recover required the greatest care and attention, and were long in regaining their usual strength and vigour.

In one of the first cases of this malignant form, I tried the effect of blood-letting before the pulse had become much enfeebled; though even from the beginning of the affection there is a peculiar compressibility of pulse by which this form may be recognized before any other symptom appears. In this case the violent retching and vomiting, and acute pain of the head previously complained of, were much abated, and all the subsequent symptoms proved much milder. The eruption which, previous to the blood-letting, was confined to the upper part of the trunk and neck, now appeared generally over the body, but of the characteristic dark livid or purple hue, with some *petechiæ* and *vibices*. The head was kept cool by wet cloths; the ulcers on the throat were daily touched with nitrate of silver; the mouth frequently syringed with a solution of alum in vinegar and water; and the bowels kept open by means of injections. The strength was supported with wine; but it was three weeks before the patient could be said to be out of danger. Recovery was in this case retarded somewhat by a slight dysenteric attack at the end of the fourth week; but after this the patient rapidly improved.

The success of the blood-letting in this case led me to adopt the practice in similar cases; and where it was had recourse to at a sufficiently early period of the disease, I found that the subsequent symptoms proved much milder, and the chances of recovery were greater, than when this had been omitted. The cases in which I did not see the patient till too late for such depletion, generally proved the most intractable. In several of them where leeches had been ordered to the head, from the evidently congested state of the vessels in that region, I have seen the leeches drop off dead almost as soon as they had pierced the skin.

The success of the above treatment was such, that out of seventy-six cases of scarlet fever only two died. The one, a case of the malignant form, terminated fatally on the sixth day of the disease; the other, of the anginose variety, with acute general *bronchitis*, on the third day. No inspection was allowed in either case.

Scarlatina is one of those diseases which require the most careful treatment during convalescence. In many cases the *sequelæ* of this disease are more formidable and alarming than the disease itself. There appears to be no form of scarlatina, excepting perhaps the malignant, that may not be followed by those dangerous anasarcous swellings, which have been but too common in the late epidemic scarlet fever which has visited this city. Those who had passed through the disease mildly appeared to be even more liable to attacks of this kind than those attacked with the disease in a severer form. But in this respect every variety was observed.

These dropsical affections were much more frequent during the months of October, November, December, and beginning of January, than afterwards. In the most severe cases the swelling came on suddenly, without any previous complaint, generally from a fortnight to three weeks after the disappearance of the eruption. The little patient, (for I have never witnessed a case above the age of puberty,) was often put to bed apparently quite well, and it was frequently not till the middle of the night, or next morning, that the friends were alarmed by the sudden swelling of the body of the child, attended with great difficulty of breathing, moaning, restlessness, and in some cases, stupor. In one very severe case, the child, of six years of age, had been put to bed quite well about 10 o'clock, and, when the mother went to see if her children were all quiet before retiring to her own apartment, she was alarmed to find this child swollen all over, with the eyes fixed, the extremities cold, and with stertorous breathing. The child was perfectly insensible, and the pupils did not contract on the approach of a lighted candle. Twelve ounces of blood were drawn from the arm, which at first fell drop by drop, but afterwards came away in a full stream; a stimulant clyster was administered; heat applied to the surface of the body; and by next morning the child was so far recovered as to sit up in bed.

In all cases of this dropsical affection in which the urine was examined, it was found coagulable by heat. In many of the severer cases, the urine passed before the accession of the dropsy was very turbid, dark-coloured, in a few cases bloody, and in all highly coagulable. In two cases it was entirely suppressed.

In the severe cases, the œdema extended over the whole surface of the body, being usually observed first about the face, but rapidly spreading to other parts of the body. The fluid was not confined to the cellular tissue alone, for its presence was frequently noticed both in the cavity of the abdomen and chest; and from the stupor, drowsiness, and stertorous breathing, with fixture of pupil, I have been led in a few cases to infer its presence likewise in the ventricles of the brain. In some cases the abdomen was remarkably tender, and the patient lay in the same sunk supine situation as in peritonitis; in others the abdomen was free from tenderness, but preternatural fulness and tenderness was remarked in the lumbar regions.

Occasionally the swellings were confined to particular regions of the body. In some slight cases the face alone was affected; in others the extremities; but these were usually the mildest cases; yet even in these the urine was found more or less coagulable by heat.

I have every reason to believe, that cold applied to the surface of the body in some way or other was the immediate cause of the dropsical symptoms which follow *scarlatina.* In several of the severer cases, the attack was ascertained to have followed exposure to cold; but in others such a connection could not be traced. The cutaneous vessels are well known in this disease to take on an excited action, to repair the loss of the cuticle, which is usually thrown off after the febrile symptoms have subsided. An increased vascular action, and more particularly of the cutaneous system, is consequently observed during the time this process is going on. The pulse is generally somewhat quicker, and the appetite frequently almost ravenous; whilst the surface of the body is usually hotter than in health, though not to such an extent as to excite unpleasant feelings in the patient. But notwithstanding this increased circulation in the cutaneous vessels, (the general system being in a weakened state on account of the previous illness, and the vessels not having recovered their usual tone,) the surface of the body is easily chilled, particularly if exposed for any length of time; the blood circulating there is thus thrown upon the internal organs in unusual quantity, and those, whose action is vicarious with that of the skin, are generally found to suffer most. The kidney is therefore the organ first to suffer. If the application of cold to the surface of the body is only moderate, its action is merely increased; but if the cold has been applied for a longer period of time, and the secretion from the cutaneous surface is materially diminished, from too great action being excited in the kidney, in its weakened state, its action becomes disordered, and disease is the result. That such is actually the case, several recorded dissections of persons who have died from this disease have proved; and the success of the practice, which I was led to adopt, fully justified me in the views I had taken of its nature and origin.

In all cases, excepting in the very mildest, I bled to a greater or less extent in proportion to the severity of the symptoms, and the relief experienced from it. Wherever it was practicable, or the parents would allow it, blood-letting from a vein in the arm was preferred, because the symptoms were much sooner relieved by such a practice, and more effectually, than when leeches were applied to the loins or other parts of the body. When, however, this was impracticable, or where the child was under two years of age, leeches were used, but always in such numbers as to cut short the disease as soon as possible, and not trust to the removal of the requisite quantity of blood by subsequent fomentations; though these were also occasionally employed. In all the severe cases, the safest and most certain mode of relieving all the urgent symptoms, was to carry the blood-letting to such an extent as to produce a marked action on the pulse. With regard to the quantity of blood drawn, I have frequently bled to the extent of twelve ounces, and in one severe case no less than eighteen ounces were withdrawn with the most manifest advantage. I usually followed the bleeding by small doses of antimonial wine, with the *liquor acetatis ammoniæ*, and where the urine had been entirely suppressed, a large hot bran poultice applied to the lumbar region. In the milder cases, brisk purging, with antimonials, and the *liquor acetatis ammoniæ* with the warm bath, relieved all the symptoms. In all cases the warm bath was of the utmost advantage.

Of fifteen cases in which dropsical *sequelæ* occurred, only *one* died. This was a boy 5½ years of age, in whom the parents would not allow bleeding, either from the arm, or by leeches to the lumbar region. Solution of tartar emetic with the *liquor acetatis ammoniæ*, purgatives of jalap and calomel, the warm bath, and a bran poultice to the lumbar region, were all applied in vain; for delirium followed by coma rapidly supervened, and he died forty-eight hours after being first noticed to complain. He had had a very mild attack of the scarlet fever without efflorescence three weeks before, had been chilled from exposure for some hours to a cold frosty wind on the 14th of November, and died on the evening of the 16th. No inspection was allowed.

The blood when drawn from the arm in these cases usually presented a small proportion of *crassamentum* to serum; was more or less buffed, and occasionally cupped. In two cases, which had followed rather severe attacks of the anginose variety, where the peculiar papular appearance of the eruption was distinctly marked, the serum was milky, and when treated with ether gave a considerable quantity of fatty or oleaginous matter.

The only other *sequela* which it is necessary to mention here, is a troublesome purulent discharge from the internal ear. This affection was remarked to be more liable to come on in children of a scrofulous habit of body, and in the anginose variety of scarlatina. In general it began with slight deafness in one or both ears, a few days after the child first began to complain, and whilst the efflorescence was still visible. It was chiefly observed in that form where the affection of the throat was one of the most prominent symptoms of the disease, and appeared to be caused by the inflammation extending along the Eustachian tube to the internal ear. If noticed early, whilst in this stage, a few leeches behind and around the ear, and a large emollient poultice applied externally, with strict attention to the throat and the due evacuation of the bowels, prevented all unpleasant symptoms, and it rarely went further; but where only one ear was affected, and the patient so young as not to be able to give a distinct account of his feelings, it was apt to be overlooked, till the *membrana tympani* had given way, and a quantity of purulent matter was discharged. Even then the greatest advantage was derived from the application of leeches, followed by emollient poultices, frequent syringing of the ear with tepid milk and water, and attention to the general system. Under such treatment the discharge ceased, and the hearing was restored. Where the discharge threatened to continue, under the use of a blister behind the ear it usually ceased. In all the cases which terminated thus favourably I afterwards found the membrane of the *tympanum* cicatrized.

One case, however, did not terminate thus favourably, and, as I had afterwards an opportunity of examining the diseased parts, I shall give account of it.

A. W. aged 7, was attacked on the 20th of November 1835, with scarlatina; on the 23d the efflorescence had suddenly receded, and I was called to see him. His pulse was 130, sharp; the breathing was hurried, with short distressing cough and subcrepitous rattle; the face was flushed, and the eyes were intolerant of light; the abdomen tender to the touch; and he was lying on his back, sunk in bed, and his legs drawn up. He was bled to about twelve ounces, which caused slight faintness; a sinapism was applied over the abdomen; a purgative glyster administered; and when the sinapism was removed, as tenderness still continued, a bran poultice was applied. After this the efflorescence reappeared over the body, though not very bright, and continued out for a few days; when it was followed by desquamation. The fauces were slightly ulcerated, but rapidly healed under the use of the nitrate of silver. On the 28th he complained of slight deafness. To remedy this, a few leeches were applied round the ear, followed by an emollient poultice. A slight discharge of purulent matter, however, appeared a few days after this, from the right ear, but gradually abated under the use of tepid injections.

I had ceased attending for upwards of a fortnight, when, on the 17th of December, I was requested to see the child. The ear was again discharging, and the glands on the right side of the neck were considerably swollen. The pulse was irregular, 90 in the minute, and weak; the bowels were constipated; the skin moist; and the child very weak, but no febrile symptoms were recognized. Bitters in very small quantities, with gentle laxatives, and a slightly stimulant wash, consisting of one grain of sulphate of zinc to one ounce water, were employed. Under this treatment he recovered his appetite, and by the 24th December the swelling of the glands of the neck was almost entirely gone.

On the 25th December, a change for the worse had taken place. The child was restless, and tossing about in bed. The heat of the surface was much increased, and pain of the head was complained of. The discharge from the ear had ceased. A dose of calomel and jalap was administered; a few leeches were applied round the ear, and he was bathed in the evening. These measures reduced the heat of the surface, the pulse became nearly natural, and he fell asleep.

About three o'clock on the morning of the 26th, I was called to see the child, as he had been attacked by a severe shivering fit, with acute pain in the head. The pulse had risen to 180, was sharp, and rather hard. The eyes were rolling wildly; the pupils were contracted, and the countenance was anxious. Though the surface of the trunk was hot, yet the extremities were cold, and the child complained of cold. The respiration was hurried, but there was no unnatural rattle. There was acute pain in the head; and the rigor was so severe as to shake the bed on which he lay.

Blood was drawn from the arm to faintness, the head was shaved, and cold cloths were applied. The bowels were freely moved by calomel and jalap, and small doses of antimonial wine were ordered. Soon after this he fell into a quiet sleep, which lasted for eight hours.

On the 28th, the pulse had fallen to 100, and was soft. The eye was lively, and the pupil contracted freely.

On the 29th, he had a slight rigor, when a few leeches were applied to the temples, and cold cloths to the head.

On the 30th and 31st, he had several slight rigors. The pulse was weak; there was a fetid discharge from the right ear, with occasionally a few clots of blood. The purgatives, antimonials, and cold to the head were continued.

Jan. 1st, 1836. A copious discharge of bloody fetid purulent matter took place from the right ear. The pupils were contracted; the pulse 100, very weak; the bowels were open; and the surface was cool; but he had passed a restless night.

At midnight I was again called, as immediate death was apprehended from profuse hemorrhage. The blood I found flowing from the right ear, right nostril, and mouth; and it was occasionally brought up from the stomach by vomiting. This had, however, evidently been swallowed,—one clot having the form of the gullet, as if it had coagulated there. The blood thus discharged was mixed with shreds of lymph and purulent matter. It was dark, and evidently flowed from the internal ear, having found an exit both by the external ear, and downwards by the Eustachian tube. He lost at this time from six to eight ounces, but the quantity could not be accurately ascertained. By this hemorrhage the pulse was rendered very weak and compressible. The temporal arteries, however, were beating strongly, and the head was hot to the touch, though the rest of the body was cool and moist. The child soon afterwards fell asleep, and slept till noon of the 2d. The bleeding recurred at intervals during the night of the 2d, and he died early on the morning of the 3d.

The body was inspected in the presence of Drs Craigie and Home, thirty-six hours after death. It had an exsanguine blanched appearance. The muscles of the head and neck were bloodless, as were also the vessels which were divided. The skull-cap was in some points as thin as paper. The brain presented an unusual fulness, bulging upwards and over the edge of the skull in a remarkable degree. No unusual vascularity was observed on its surface. A considerable quantity of fluid was found effused beneath the membranes, over the whole surface of the brain. The substance of the brain itself was much softer than natural, and was *distinctly œdematous*. The ventricles were much softened, and distended with a clear serous fluid.

When removed from the skull, and placed with the base upwards, it was observed that the lower portion of the posterior lobe of the right hemisphere of the *cerebrum* was unusually vascular, and much firmer than the rest of the brain. The upper posterior portion of the right hemisphere of the *cerebellum* presented the same appearance. The cineritious parts of the brain at these affected portions had a very peculiar greenish hue, and exhaled a strong gangrenous odour. The white substance of these parts was little altered in colour. The brain round these firmer portions was preternaturally soft, almost pultaceous.

Upon inspecting the base of the skull in contact with those altered portions of the brain, that is, the situation of the right lateral sinus, unusual vascularity and thickening of the *dura ma-*

ter, with effusion of lymph, were found, extending from the *Torcular* along the whole lateral sinus of the right side. These parts were also considerably discoloured, and exhaled a gangrenous odour. On slitting open the lateral sinus, its coats were found much thickened, with interstitial deposits of recent lymph. The internal coat of the sinus was covered with an irregular recent deposit of lymph, was much softened in its texture, and easily scratched off. A quantity of bloody purulent matter filled the sinus. The alteration of texture did not extend further back than the *Torcular Herophili*, at which point the sinus was blocked up by a firm *coagulum*.

Where the lateral sinus passes through the *foramen lacerum*, the same disorganization was observed; a greater quantity of lymph had, however, been thrown out here. Similar morbid appearances extended about three inches down the internal jugular vein, where they stopped abruptly, the diameter of the canal being there closed by another adherent *coagulum*.

The internal ear was completely destroyed, the whole parts being in a state of ulceration and suppuration; the walls, however, were not carious. No opening into the jugular vein could be detected which could account for the bleeding; so that there seems every reason to believe, that it must have resembled those hemorrhages which are observed from other mucous surfaces in states of disease. The bones of the ear had been previously discharged. The membrane of the tympanum was completely destroyed. The Eustachian tube was highly inflamed, but pervious.

During the prevalence of the Epidemic, I met with several cases in which a peculiar rheumatic affection of the joints succeeded the disappearance of the efflorescence. Dr Alexander Murray of Alford, Aberdeenshire,* has recorded the occurrence of a similar affection during an epidemic scarlet fever which prevailed at that place in 1819–20; Dr Cock has detailed cases of a rheumatic variety of scarlet fever, as observed by him in the island of St Bartholomew in 1829–30;† and Dr Craigie, in the last number of this Journal, has narrated instances of this complication of scarlet fever. The cases which I met with occurred chiefly in the earlier part of the winter; and as this form of the disease has been generally overlooked, I shall briefly narrate the heads of two of the most severe cases.

1. Mary Kennedy, aged 7, was seized on the 5th of October 1835 with the usual symptoms of scarlet-fever; the efflorescence was fully out over the whole body; the febrile symptoms were moderate; and the throat was slightly affected. On the 10th, whilst the eruption was still visible but fading, she began to

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* Edin. Med. and Surg. Journ. Vol. xvii. 342.

† Ibid. Vol. xxxviii. 28.

complain of pain in the right wrist and hand, which were considerably swollen, with a vivid redness on the surface, and tender to the touch. The local heat was increased, and there was also slight increase of the febrile symptoms. The redness was of a general diffuse blush, similar to that observed in some cases of severe rheumatic affections of the joints, or in gout. The little sufferer was unable to move the hand or fingers, and screamed whenever the parts were touched.

On the 11th, the left foot was similarly affected;—the foot and toes being red, swollen, hot, and extremely tender to the touch, or on the slightest motion. No change had taken place in the right hand and fingers.

On the 12th, the pain in the foot was less severe, but the knee was just commencing to be similarly affected; the efflorescence on all parts of the body had disappeared, and desquamation had commenced, so that the redness peculiar to this complaint was easily observed.

Little change took place till the 16th, by which time the pain in the wrist had abated; as had also that in the foot and knee, but a degree of swelling still remained, rendering them stiff. On the 18th, the swelling was so far gone that she could use the affected parts freely, though it was perceptible for a few days longer.

During the whole course of this affection, the pulse had remained quick, being always above 100. The urine was slightly turbid, but not coagulable by heat.

2. Euphemia Kidd, aged 8, was attacked with scarlet fever, on the 12th December 1835. The efflorescence was copious and of the usual appearance; and the throat was slightly affected.

On the 18th, she first complained of pain in the left wrist and fingers, increased by the gentlest touch, or on the slightest motion. An erythematous redness extended over the fingers, hand, and half-way up the fore-arm, all which parts were much swollen and preternaturally hot. The pulse had risen to 120, and there was an increase of febrile heat.

Little amendment took place till the 22d, when the affection suddenly left the left-hand and wrist, and attacked in a similar manner the right-hand, wrist, and fingers. The pulse, which had fallen to below 100, now again rose to 120.

The parts had nearly regained their usual appearance by the 30th, some slight swelling and redness alone remained, and the pain was gone.

On the evening of the 31st, I was sent for in great haste, as the patient was seized with symptoms threatening instant dissolution. I found her sitting up in bed, with a short, dry, incessant, distressing cough, and gasping for breath. The breathing was quick and short, with much heaving of the chest; the action of the heart was tumultuous and diffuse, but without unusual *bruit*. The pulse was 130, intermittent, and scarcely perceptible at the wrist; at the humeral artery it was oppressed, small, but hard. There was great pain and feeling of oppression complained of in the region of the heart. The percussion was there dull over a much greater extent of the chest than natural, and the impulse of the heart indistinct. A dry sibilous wheeze was heard over both sides of the chest, which were, however, pretty natural on percussion. The face and lips were livid, and, together with the extremities, much swollen.

On inquiry I learnt that the patient had felt so well as to be able to sit up and take tea with the family; that she had then gone to bed, and half an hour afterwards was suddenly seized with the symptoms above enumerated.

I instantly bled her to fainting, and upon measuring the quantity of blood drawn, eighteen ounces were found to have been abstracted. This large bleeding gave almost instant relief to the pain, but she was still unable to resume the recumbent posture; the cough too was somewhat relieved, but still recurred every five minutes. The pulse, however, fell to 100, and became more regular and soft. A few doses of calomel and opium were given, and at midnight she fell asleep with the head tolerably low. The blood had coagulated firmly; the crassamentum was cupped, but had not much of the buffy coat, and was floating in a very large proportion of serum. The serum of the blood first drawn was slightly milky; in the other cups it presented the usual appearance.

On the 1st of January 1836, the swelling and lividity of the face had disappeared; the pulse was 100, soft; the cough much abated, with clear mucous expectoration; the feeling of oppression at the region of the heart was gone, and the dulness on percussion in that region less considerable; nor was there any unusual *bruit*. She could then lie with the head low on the left side, but not on the right, as it excited the cough. She had a draught of salts and senna, and a few more doses of calomel and opium.

From this period she rapidly recovered; on the 4th her appetite returned; and on the 7th she was able to be out of bed, though very weak.

This was the most severe case of the affection I met with. Other cases came under my notice where the affection was most commonly confined to the hand and wrist, or to the foot.

The treatment found to be most successful in all these cases was the local application of warmth by means of flannels wrung out of hot water, or chamomile fomentations; and diaphoretics, with mild purgatives, to reduce the febrile heat.

The urine, in all the cases where it was examined, was not coagulable by heat.

While investigating the probable causes of this affection appearing in some children and not in others, one circumstance was observed, which may tend to throw some light upon the subject. It was found that one or other of the parents of the children who were thus affected were subject to rheumatic attacks. For instance, the mother of the first case above related has had two attacks of acute inflammatory rheumatism during the last year, which presented in many respects the same general character as that noticed in her daughter, whilst under the rheumatic affection attendant on the scarlatina; and the grandmother of the same child has been bed-ridden for five years with the same complaint.

The father of the second case above related is subject to rheumatism, and had one attack, which confined him for some time last spring.

In four other cases which came under my notice the same connection was traced.

Whether these facts may in any way explain the occurrence of a rheumatic affection in children while labouring under an exanthematous disease, I do not pretend to say; but they appear to afford an easy mode of explaining why some children suffer from such an affection and others not, though I believe it has not yet been proved that rheumatism is one of those diseases which are hereditary.

21, *Rutland Street.*

Art. XIII.—*Essay on the Structure of the Mucous Membrane of the Stomach.* By Sprott Boyd, M. D.

The function of the mucous membrane of the stomach, though at all times a subject of interest to physiologists, is one which of late years has engaged a more than usual share of attention and research; and as an acquaintance with the structure of this membrane may be considered essential to the proper understanding of its functions, it has perhaps received from anatomists a more careful examination than any other portion of the mucous system. A reference to the labours of Bichat, Hewson, Home, Cuvier, and Billard will show how precise as well as extensive our knowledge of the minute anatomy of the stomach had become. The occasional discrepancies, however, in the statements of these authors appear to indicate that the inquiry had not been exhausted; and though I could hope to contribute little after the investigation of the subject by so distinguish-

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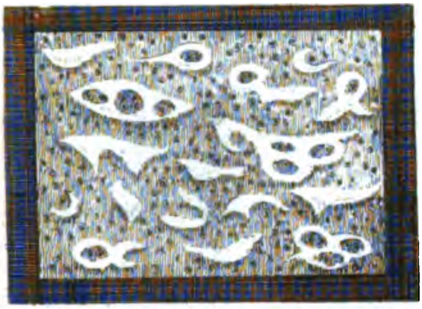

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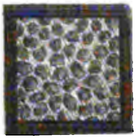

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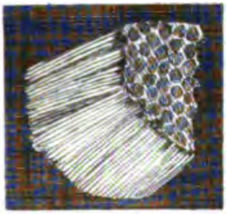

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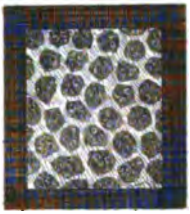

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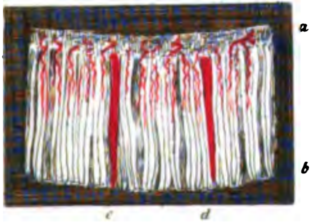

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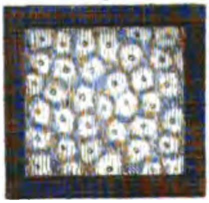

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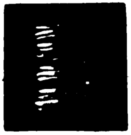

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D^r. BOYD ON THE MUCOUS MEMBRANE OF THE STOMACH.

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Plate III, p. 382, Vol. XLVI.

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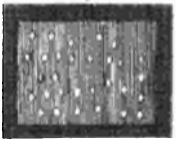

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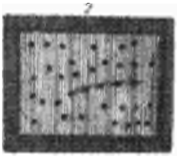

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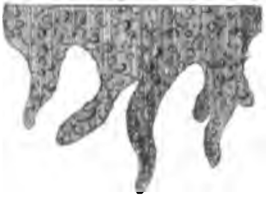

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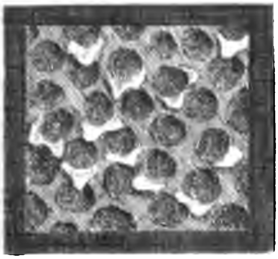

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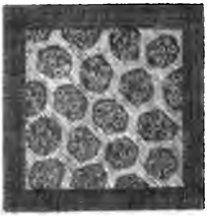

ed men, it seemed that a repetition of their observations would not be altogether an unprofitable task.

In the following pages I have accordingly endeavoured to bring together the various opinions of such physiologists as have made the mucous membrane of the stomach an object of their attention.

In the examination of these opinions, we find that there are *three* points in the anatomy of this membrane, which require separate consideration; 1*st*, Whether or not it possesses a cuticular covering; 2*d*, Its structure, whether cellular or villous; 3*d*, The glandular apparatus which it presents.

In relation to each of these points, the statements of different authors will first be brought forward, after which, a few observations, which I have myself had the opportunity of making, will be detailed.

Throughout the classes of Mammalia and Birds, the œsophagus is lined by a membrane continuous with the cuticle on the surface of the body, which is termed the epithelium. In Man this membrane apparently terminates at the cardiac orifice of the stomach; in many of the lower animals it extends much farther than this; in the pig, and in the kangaroo, it is stretched over the surface of the stomach for a few inches beyond the cardia; in the horse, it completely covers the great extremity of the stomach, and terminates about the middle of the organ, by an irregularly serrated margin, its smooth white surface contrasting strongly with the reddish velvety appearance of the adjoining mucous membrane. In the Cetacea, the epithelium lines the first of the four gastric cavities found in that order of animals; in ruminating quadrupeds again, it extends throughout the first three cavities, the fourth stomach alone possessing what may be considered a bare mucous surface.

Is this termination real or apparent? Some authors maintain that the membrane merely becomes attenuated, and is continued over the whole internal surface of the alimentary canal; and such a belief, it is said, is warranted by the similarity which exists between the mucous tissue and the external skin, both in their structure and their functions.

Cuvier, indeed, affirms the inner coat of the intestinal tube to be essentially nothing more than a reduplication of the external covering of the body. "The nervous coat of the stomach," he remarks, "continuous with the derma, the principal layer of the skin, is lined by a membrane continuous with the epidermis, thin, soft, and transparent, and as easily regenerated, when removed, as the cuticle on the surface. It is always coated with mucus, and is pierced by pores, through which that fluid escapes. In particular situations, where it is exposed to much friction, as in the gizzard of granivorous birds, this membrane becomes hard and callous." Rudolphi lends to this opinion the full weight of his authority. The true mucous membranes, he remarks, have no free sides, but are placed between other membranes, and bear to the cutis or true skin the same relation as the epithelium which covers them bears to the cuticle. He styles it indeed "the most common error of modern times," to imagine that the mucous coat is actually that which lines the intestinal canal; and lays it down as well ascertained, that the epithelium, so distinct in the œsophagus, is continued throughout the intestine in the form of a delicate transparent membrane.

The most powerful argument in support of this opinion is drawn from the partial developement of the cuticular layer in various animals. Rudolphi states, that he "observed in the intestines of a badger the same laminated structure which so frequently happens in the epidermis, and Hedwig observed the same thing in mangy dogs."

In granivorous birds a distinct epithelium lines the œsophagus. Where the gastric glands do not form a zone around the upper part of the stomach, but, as in the Ardea argala (or adjutant crane,) open into two circular spaces of very limited size, the epithelium is prolonged between these spaces, and apparently becomes incorporated with the lining membrane of the gizzard. In the majority of cases, however, where the gastric glands form their usual zone, the horny layer apparently ceases by a well-defined margin before the glands commence, and around their orifices the surface has all the appearance of a bare mucous membrane. Yet over this surface the epithelium is continued, as its remarkable developement in the gizzard fully proves; so that the mere difference in appearance does not necessarily indicate a difference in structure, and the circumstance of an epithelium not being distinctly visible in the intestinal canal of Mammalia does not preclude the idea of its existence.

It may, however, be remarked, that, often as this layer has been described, the description does not in any one instance seem to have been drawn from actual observation; and the characters are given us, not of a membrane that has been witnessed and examined, but of a membrane such as an attenuated film of cuticle might be supposed to form. Its existence is strenuously denied by Bichat, inasmuch as it cannot be raised from the subjacent tissue by the finest instrument or most delicate dissection: boiling, maceration, which we might suppose would produce its separation, have no such effect; and blistering, so certain a means of raising the cuticle which covers the external skin, exerts no similar action on that which lines the intestine.

The argument, too, drawn from the gizzard in birds, is imperfect in some particulars. Mr Hunter observes, that the epithelium in the gizzard, and the epidermis on the surface, are attached to the structures beneath in somewhat different ways. The papillæ in the external skin arise from the derma, and enter into little cavities formed in their cuticular covering. In the gizzard this arrangement is reversed, the papillæ spring from the external surface of the horny layer, and are received into depressions in the subjacent tissue.

With such arguments on either side of the question, this point of anatomy seems at the present time to rest; nor do later writers enter into the subject, but content themselves with the simple expression of their opinion; some, as Elliotson, affirming the epithelium to be continued throughout the alimentary canal,—others, like Billard, asserting that it terminates at the *cardia*.

So far as simple inspection entitles us to form an opinion, the epithelium in man may be said to terminate at the lower extremity of the œsophagus, by a margin, which, though somewhat irregular, is generally well defined. This layer, which in the recent state is soft and pliable, and closely adheres to the mucous surface beneath, is rendered extremely brittle by immersion in spirits, so that the slightest transverse extension of an œsophagus that has been thus preserved, ruptures it in a hundred different directions. Its free surface exhibits a minutely papillar appearance, the papillæ scarcely projecting above the surrounding membrane, of a whitish colour, and (immediately above the cardia) arranged in irregular transverse lines. Plate III. Fig. 1. On separating the epithelium from the layer beneath, and examining it by a magnifier with transmitted light, it seems to be almost perforated by numerous small canals, corresponding in situation to the papillæ alluded to; viewing it on an opaque ground, a similar appearance is perceived; it is evident, however, that the membrane is not completely perforated, but merely thinner where it covers the extremity of each papilla.

On examining the surface of the epithelium which adhered to the mucous layer, the appearance is presented of openings running obliquely towards the free surface, and forming evidently the canals into which the papillæ enter. Plate III. Fig. 2.

These last mentioned bodies are minute projections from the mucous layer, ranged pretty closely to each other, each about $\frac{1}{150}$ of an inch in length, and $\frac{1}{1000}$ of an inch in diameter, in both measurements, however, exhibiting slight variations. They are not perforated by any canal, but appear to be composed of a homogeneous cellular tissue. Plate III. Fig. 3.

In the horse, the epithelium, as Sir E. Home has shown, covers the cardiac portion of the stomach, and terminates about the middle of the organ, by a serrated margin, not being continuous with, but elevated above the adjoining mucous surface. While the membrane is attached to the subjacent structure, its surface presents a faintly papillar aspect; on gently detaching it with the handle of a scalpel, we do not, as in the human œsophagus, come at once to the surface from which the papillæ rise, but find interposed a second layer, of about the same thickness as the epithelium itself. If we examine either side of the detached portion of epithelium by transmitted light, the papillar aspect is not discernible, but the membrane appears marked by dark specks, corresponding in number and situation to the papillæ which it had covered. Plate III. Fig. 4.

The intermediate layer presents to the microscope a smooth equal surface; it is perforated by numerous foramina, about the 600th of an inch in diameter, (or perhaps a little smaller,) and having their margin slightly thickened, Plate I. Fig. 5, which, it is evident, give passage to the papillæ, with which the third or mucous surface is closely studded. These bodies are of conical form, of considerable length in proportion to their breadth, Plate I. Fig. 6; a circumstance made apparent only, by a lateral view, as when looking directly down upon them they appear short and flattened. No duct or tubular structure of any kind could be detected, even by a powerful magnifier, (a lens of $\frac{1}{13}$ of an inch focus.) Their structure appeared similar to that of the papillæ in man.

The middle perforated layer, which I have just described as existing between the epithelium and the papillar membrane in the horse, appears to be analogous to that spoken of by Malpighi in his letter on the structure of the tongue. "In the larger ruminating quadrupeds," he remarks, "when the external membrane covering the tongue is removed, a glutinous substance presents itself, extended over the upper part of the tongue, white where connected with the exterior layer, dark where attached to the parts beneath. It is marked by conspicuous foramina, corresponding to the papillæ, between which innumerable small canals are visible to the microscope, varying in figure, and opening on the external surface of the tongue." Malpighi imagined that these "conspicuous foramina" naturally existed in the membrane which he described. Albinus, who repeated the observations of the Italian physiologist, formed a different opinion. He conceived that the membrane was not naturally perforated, but that it, as well as the epithelium, was extended over the surface of the papillæ. In this way, the two layers were connected most firmly, where they covered these bodies, and consequently, when the epithelium was removed, the small portion of the subjacent layer corresponding with the papillæ was detached along with it, and an aperture was left.

To determine the respective accuracy of these opinions would require a detailed and minute investigation; meanwhile it may be remarked, that the appearance of the epithelium by transmitted light rather favours the idea of Albinus. We would naturally expect the membrane to be more translucent where it covers the extremities of the papillæ, as indeed is the case in man; on the contrary, we find it more opaque, and this appearance could only be produced by a greater thickness of the membrane at these points than throughout the rest of its extent.

I have not been able to trace in the epithelium of any other animal a structure similar to that existing in the horse. In the pig, this membrane is considerably thicker than in the horse, and adheres much more firmly to the mucous surface beneath, so that it is almost impossible to examine the manner in which they are connected to each other.

The first three stomachs in the calf exhibit, with scarcely any modification, one kind of structure. The cavities in the first stomach, the cells in the second, the plicæ or folds in the third, are all studded with numberless papillæ, varying in size and mode of arrangement, but all presenting the same conical form. On these the epithelium is closely applied, becoming extremely thin where it covers the apex of each papillæ; nowhere is there any trace of an intermediate cribriform layer such as exists in the horse. When the epithelium is removed, the papillæ are seen formed by partial elongations of the mucous membrane. In the deer, Sir E. Home observes that each of these bodies contains an excretory duct opening by three orifices at its apex. In the calf, however, there was no appearance of any similar structure.

In other animals, as the dog, cat, rabbit, the epithelium does not present any peculiarity. It is difficult to examine its structure, in consequence of its firm attachment to the subjacent membrane, which exhibits the same minute papillæ that have been already noticed.

The structure of the internal or mucous coat of the stomach presents itself as the second part of our subject. In systematic anatomical works, this membrane is commonly spoken of as exhibiting a villous surface, one, indeed, in which the villi are peculiarly prominent, and from which it derives a delicate velvety appearance. This opinion is sanctioned by high authority. "In man," Haller remarks, "and much more distinctly in some other animals, filaments or *villi* are perceived, projecting into the cavity of the stomach, shorter, however, than those in the intestines. The nature of these appears everywhere the same. Through them, viz. the arteries and veins, open into the gastric cavity."

According to Bichat, *villi* or *papillæ* might be detected throughout the whole mucous system. "They are found," he says, "though no doubt extremely short, in the frontal sinuses and urinary passages. On the tongue again, the intestine, the stomach, the gall-bladder, these bodies are remarkable for their length." The assertion, however, which almost immediately follows, viz. that in the stomach and intestine the villi lie so close together, that at the first glance the membrane wears an uniform aspect, is not consistent with the idea of remarkable length; and it appears probable, from the circumstance of the mucous surface of the gall-bladder and some other organs, which is declared to be villous by Bichat, presenting scarcely a trace of such a structure, that this celebrated anatomist was somewhat hasty in his generalization of the characters of mucous membranes.

Cuvier merely adverts to the mucous membrane of the stomach in man. "Its inner surface," he observes, "is remarkable for a number of very fine folds, which give it a velvety appearance, and which are almost wholly composed of sanguiferous vessels. In different animals, these folds of the internal membrane present varieties of size and form. Sometimes they are scarcely visible, and the surface of the intestine appears perfectly smooth; sometimes they are scattered like little rounded granules, or like filaments, enlarged at their extremities, or tapering more or less to a point. In several animals, again, the inner surface of the intestine" (he speaks of the stomach) "instead of being marked by projecting folds of membrane, is hollowed out into numberless little depressions, as in the sturgeon and certain of the tortoise tribe; in others, as the frog and crocodile, the surface merely exhibits slight furrowed lines, which take a serpentine course in different directions."

Billard, one of the latest authorities on the gastric mucous membrane, supports the idea of a villous arrangement. "The villosities," he says, "exist generally over the mucous surface, and are particularly abundant towards the pylorus, where they are grouped together, slightly flattened, and separated from each other by very fine lines. In the healthy stomach, the naked eye perceives these but indistinctly; in one case, however, he remarked the folds of the membrane, which are commonly irregular, to be thrown into a lozenge form, like the reticulum in ruminating quadrupeds; while the *villi* were so developed, that, by passing the finger over them, they might be laid flat or raised again."

Authorities of equal weight, however, may be brought forward in support of the other opinion, that the arrangement of the mucous membrane in the stomach is not villous but cellular. The latter structure, indeed, is taken notice of by Haller, who speaks of the internal surface presenting very small rugæ, which, upon close inspection, seem to be arranged in a reticular manner, appearing to be a rudimentary form of the reticular structure, which is so beautifully displayed in the second stomach of ruminating animals. The same opinion is more distinctly affirmed by Hewson, who, though he states the whole surface of the intestinal tube to be covered by villosities, admits, that, in the large intestine, these bodies are so short, that the surface appears smooth to the naked eye, while no true villi are detected by the microscope; only, the partitions between the cells resemble *villi* in their structure. In the stomach a nearly identical appearance is found: "At the upper part of this organ, the villous coat appears in a microscope like a honeycomb, or like the second stomach of ruminating animals in miniature; that is, full of small cells, which have thin membranous partitions. Towards the pylorus, these partitions are lengthened, so as to approach to the shape of the villi in the jejunum."

Fordyce was led by his researches to believe that the stomach, strictly speaking, possessed no true internal membrane. The mucous layer and submucous cellular tissue he conceived to form but one structure, which, loose externally, where it was attached to the muscular fibres, became more and more condensed towards its internal surface, till it was able to retain the aliment which the stomach received. On the surface of the stomach, "the laminæ of this cellular tissue might be perceived crossing one another so as to form a number of irregular cells. The surfaces of each of these membranes were covered again by finer and smaller membranes, again crossing one another, so as to form lesser and shallower cells, which very much increased the interior surface." On microscopic investigation, he, without good reason, placed little reliance. The objection, that in different lights different appearances are apt to present themselves, again varying according to the degree of moisture of the mucous membrane, is no more to be urged against examination by the microscope than against that by the naked eye; and optical deceptions are little likely to occur, unless the magnifier be of much higher power than what is required for minute inspection of the mucous surface.

To Sir E. Home we owe the most minute description of the cells alluded to. He states, that "they are found in the form of a honeycomb in the upper arch of the stomach, and are of greatest depth in this situation, though seen all over the cardiac portion of the organ, but so faint that a high magnifying power is required to render them visible. In the pyloric portion, the same cellular appearance continues; but here and there are small clusters, the sides of which rise above the surface, giving the appearance of foliated membranes."

In describing the stomach of the Cetacea, Cuvier makes mention of a structure in the second and fourth gastric cavities, which he does not appear to have remarked in any other animals. "The internal membrane of the second stomach," he says, "is in great measure composed of fibres, perpendicular to the two surfaces, placed very close together, which perhaps are of a glandular nature. These fibres exist equally in the internal membrane of the fourth stomach, but in that of the third no similar appearance can be traced." This observation of Cuvier's has been repeated with regard to the second stomach of the porpoise by Dr Knox, who conjectured that the fibres might exercise electric phenomena, as connected with the process of digestion. On examining this structure by the microscope Dr Brewster ascertained the fibres to be minute tubes, while the internal membrane appeared covered with hollows or depressions, corresponding with their extremities.

I have already described the structure of the epithelium, down to where it seems to terminate at the cardiac orifice of the stomach. So soon as the line of demarcation is passed, a very different aspect is presented. In some cases the mucous membrane exhibits a loose flocculent appearance, without any well defined structure. This may perhaps be referable to *post-mortem* changes. In other cases, again, where *post-mortem* alterations cannot be remarked, an irregular honeycomb appearance of the mucous membrane is observed, the cells being of considerable size, about $\frac{1}{80}$ or so of an inch in diameter. Very soon, however, not half an inch from the cardia, these give place to the small regular cells, which may be said to characterize the whole of the inner surface of the organ. The appearance of these cells, throughout the cardiac portion of the stomach, corresponds to the representation given of them by Sir E. Home. When the mucous membrane is extended, they appear tolerably regular both in form and size, varying from $\frac{1}{400}$ to $\frac{1}{830}$ of an inch in diameter, being smaller in the young man than in the adult subject. Towards the pylorus, the mucous membrane, which is thin throughout the great *cul de sac* of the stomach, becomes considerably thicker, the dimensions of the cells are increased, and an appearance somewhat resembling that described by Sir E. Home is perceptible. He mentions the patches distinguished by the foliated membranes as existing particularly towards the pylorus. They may be found, however, in the cardiac portion of the stomach likewise; perhaps not actually at the great extremity, but certainly opposite the termination of the œsophagus. In the engraving given by Home of these patches, the wall of each cell is represented as rising above the general surface of the stomach, and being cleft into a number, ten or a dozen, of rounded segments, which form a complete fringe about the mouth of the cell. These projections of the mucous membrane are, so far as I have been able to observe, much less numerous. There is no regular fringe, but here and there a prolongation of membrane, resembling an ordinary villus of the intestine, rises from the partition between two cells. Plate III. Fig. 7. These bodies, from their small size, are not easily distinguished: they give to the surface a more flocculent and velvety appearance than is presented by other parts of the stomach. The cells near the pylorus are in some cases about $\frac{1}{100}$ of an inch in diameter; and on examining them on a dark ground, and with the aid of a reflector and a magnifier of $\frac{1}{4}$ of an inch focus, their interior is pretty distinctly seen, presenting an appearance similar to what I have presently to describe as existing in the stomach of the pig, when it is more clearly visible, and more easily examined. The floor of each cell appears perforated by numerous circular openings, as if a number of tubes opened on it, Plate III. Fig. 8; and on making a vertical section of the mucous membrane, it is seen to be composed of striæ or fibres running perpendicularly from the free surface of the membrane to the cellular coat beneath.

These fibres appear, partly from direct observation, partly from the analogy of a similar structure in the pig, to be small tubes lying parallel to each other; one extremity of which is shut and attached to the submucous cellular layer, while the other opens on the free surface of the mucous membrane itself. In the majority of instances, the cardiac part of the stomach exhibits a closely similar structure; sometimes, however, where the mucous membrane is very thin, a different appearance is perceived. The surface under the magnifier displays no regular honeycomb structure, but is thrown into small folds, analogous to the villi in the duodenum, which present an infinite variety of form. Some have a broad attachment to the surface of the stomach, and project but slightly into its cavity; others again, from being much elongated, closely resemble the villi of the duodenum; some run in a straight line, others take a circular course, and form a cell, or half a cell, or a series of cells gradually passing into the perfect honeycomb structure. Plate IV. Fig. 1. Uniformly scattered over the membrane between these folds, the little tubes I have alluded to, are seen. Towards the pylorus these are long, ranged closely together, and open into the cells; here again they are extremely short, little more than simple rings lying on the membrane, and they are not set close together, but open separately and primarily on the mucous surface. Plate IV. Fig. 1. They are about $\frac{1}{500}$ of an inch in diameter, appear to have no immediate connection with the cells, into which they generally open, and possibly are subservient to a different function.

In the pig, the surface of the mucous membrane exhibits to the naked eye considerable differences in appearance. Throughout the cardiac portion of the stomach, it is of a greyish hue, and is marked by numerous small sulci of tortuous form, which, together with the corresponding elevations between them, give the membrane somewhat of a glandular aspect. About the middle of the stomach on the greater curvature, the furrows become larger and deeper, dividing the membrane into larger compartments, while the surface has a pinkish red colour, and has more of a flocculent appearance than towards the cardia. Near the pylorus the furrows almost disappear, and the surface is comparatively smooth and regular. These sulci are not incidental folds of the mucous coat, for no distension of the stomach produces their obliteration; the honeycomb structure exists throughout, the cells being considerably larger than those in man, and visible on close inspection even to the naked eye. In the cardiac portion the walls of the cells are smooth and regular, Plate II. Fig. 2; near the pylorus they are fringed with partial prolongations of the mucous membrane.

The lining membrane of the stomach throughout, and particularly towards the pylorus, is of remarkable thickness, and at the same time of firm consistence. Making a vertical section with the knife, or, what is better, scratching it through, it appears composed of slender parallel fibres, each about $\frac{1}{300}$ of an inch in diameter, closely arranged together, running perpendicularly from the surface to the cellular tissue beneath. Plate IV. Fig. 3. Removing the surface of the mucous membrane by a horizontal section, the cut surfaces of these fibres present themselves, showing their cylindrical form. Again slicing off a thin layer, and viewing it under the microscope by transmitted light, the section of each cylinder exhibits the appearance of a ring, indicating its having formed a part of a tube; and, placing a small portion of the mucous membrane on an opaque ground, and using reflected light, the mouths of these tubes can be distinctly perceived within the cells; a variable number of tubes, 2, 3, 4, opening into each cell according to the form and size of the latter. Plate IV. Fig. 4. Where they are attached to the cellular coat of the stomach, they terminate by shut extremities amid a close plexus of capillaries, from which vessels arise, and, running parallel to the tubes in the cellular tissue which unites them, ramify minutely on their surface. Plate IV. Fig. 5. The injection is apt to force its way into the tubes, which then appear of a somewhat conical form, Fig. 5, tapering slightly as they approach the free surface of the membrane.

In the horse, where the epithelium terminates, the mucous membrane at the first glance wears a villous aspect even under the magnifier. On close inspection, however, the reticular structure becomes evident, similar to, though fully more minute than, that which we find in man. Proceeding along the surface towards the *pylorus*, the same arrangement is perceived, becoming more and more combined with the villous structure; the walls of the cells are prolonged, and float loosely in the water, under which it is necessary to examine them, and their orifices consequently are manifest only in particular points of view. A perpendicular section of the membrane displays the tubular structure, which is here extremely soft and delicate. I could perceive the extremities of the tubes at the bottom of the cells, but not very distinctly, partly from the small size of the latter cavities, partly from the way in which they are obscured by the surrounding *villi*.

The honeycomb appearance in the fourth stomach of the calf, though very minute, the cells being not above $\frac{1}{500}$ of an inch in diameter, is yet extremely distinct. The mucous membrane, compared with that of the pig, is thin; the tubular structure, however, is perceptible, as indicated by the fibrous appearance which a section of the membrane presents; although, owing to the small size of the tubes, their openings into the cells could not be distinguished.

The appearances in the stomach of the sheep closely resemble those just mentioned; the tubular structure is fully more distinct, each tube being somewhat more than $\frac{1}{1000}$ of an inch in diameter. By transmitted light they appeared of a reddish-yellow hue; some seemed empty; in others, the contents appeared as if coagulated by the spirits in which they had been preserved; and under a high magnifying power, (120 diameters,) the thickness of their walls could be distinctly observed, as marked by two parallel lines running close to each other, and forming a shut sac at the extremity farthest from the mucous surface.

The structure of the inner membrane in the dog and cat appeared precisely the same. The honeycomb appearance is in both well marked; the tubular structure is observable in both, particularly towards the pylorus, where in the dog the tubes are seen to terminate in the cells.

The mucous membrane in the rabbit is somewhat different. After repeated examination, I concluded that it resembled the stomach of the horse in presenting a combination of cellular and villous structure, such as Sir E. Home described in the patches of the stomach in man. On later inspection, however, I could not discern in the cardiac portion any cellular structure; the surface appeared studded with close set cylindrical papillæ, in which an internal cavity could not be satisfactorily perceived, but which I believe to be a tubular structure, resembling that which has been noticed as existing in the cardiac portion of the human stomach.

In the hedgehog, on extending a part of the cardiac end of the stomach, most frequently no cellular structure can be perceived, and a crowded assemblage of small white papillæ is alone visible. In particular lights, however, a cellular structure is seen to exist, appearing stretched like a fine net-work over the upper surface of the papillæ. The partitions between the cells are extremely thin, and send out slender filaments, which near the pylorus float over and obscure the cells themselves.

In the mole, the pyloric portion of the stomach exhibited the honeycomb structure, well marked, though minute. In the cardiac portion it was less distinct; but the more flocculent aspect of the surface might be attributed to the action of the gastric juice before the stomach was opened. The duodenum also was cellular, but the cells were very different from those of the stomach. In the stomach they were uniform in size, and regular in shape; in the duodenum they were of all shapes and sizes, the larger cells being redivided into smaller compartments.

In the second stomach of the porpoise, the tubes are about $\frac{1}{16}$ of an inch in length, and are easily seen. The cells on the surface of the inner membrane are extremely small, so much so, that each, as Dr Brewster believes, is probably the orifice of a single tube. In the third cavity, the honeycomb structure is very distinct, but the tubes are wanting, and the membrane is directly applied on the cellular tissue beneath.

In the fourth stomach, again, the appearances are precisely similar to those found in the second; the tubes are considerably shorter, but their diameter and mode of termination at the surface are the same.

The stomach of the turtle consists of two portions, separated from each other by a slight constriction. In both, the muscular parietes are of considerable thickness, particularly in the second; though the difference between the two is by no means so marked, as that the latter should be entitled to the name of gizzard, which Sir E. Home has bestowed upon it. In the first portion the inner surface has a rough flocculent appearance, without any well-defined structure; in the second, the membrane is thrown into longitudinal folds, and exhibits the honeycomb arrangement very distinctly.

The mucous membrane of the stomach in the water-newt, when examined immediately after death, appeared disposed in thin irregular folds, running in various directions, and presenting neither cells nor villi. The stomach was extended, and placed in spirits, and in a day or two was again examined; it appeared a good deal changed. In the cardiac portion the indistinct flocculent surface and prominent longitudinal folds were alone visible; the pyloric portion exhibited the honeycomb structure in as well-marked a manner as any of the Mammalia. The cells were of round or oval form, about $\frac{1}{300}$ of an inch in diameter; and the mucous membrane was extremely thin, so that it was scarcely possible that any tubular structure could have existed beneath.

In the frog, the stomach, when examined immediately after death, presented no cell or prominence of any kind, but a smooth unvarying surface. After preservation in spirits, it exhibited numerous longitudinal waving ridges, running side by side to the pylorus, where the structure changed, and the mucous membrane was disposed in loose transverse folds.

The œsophagus in the haddock is lined by a shining bluish membrane, along which are ranged thin translucent folds, sending off slender prolongations, which hang loose in the cavity of the œsophagus. In the cardiac part of the stomach, the mucous lining is thrown into loose irregular cells, which in the pyloric portion become more compact, and assume a perfect honeycomb appearance. In the duodenum, however, and pyloric appendages, the cells are equally distinct.

In the whiting, throughout the whole surface of the stomach, the honeycomb structure is most distinct, except in the immediate neighbourhood of the pylorus, where the cells almost disappear, and the lining membrane is arranged in folds converging to the pyloric orifice. A slight constriction marks the opening into the intestine, on which the folds are a little way prolonged, when the cellular structure again shows itself, and is continued into the pyloric appendages.

In the common flounder, the traces of honeycomb structure were indistinct, the mucous membrane being thrown into longitudinal folds. Nor was there in the duodenum any cellular arrangement; but an extensive surface was presented by numerous duplications of the lining membrane, running along the intestine, with their free margin floating loosely in its cavity. As they recede from the pylorus, the number of these folds gradually diminishes. They probably supply the place of pyloric appendages, which in this fish are wanting.

In another species of flounder, the inner coat of the stomach displayed no cellular structure of any kind. To the naked eye it appeared perfectly smooth, and the microscope detected only very minute papillæ sprinkled over its surface. The duodenum possessed the folds already described.

Lastly, I turn to the third part of my subject, and inquire what glandular apparatus has been described by authors as existing in the gastric mucous membrane. In the human stomach, Haller remarked, such a structure could not be distinctly traced. In all parts of the organ, however, might be seen pores, from which a mucous fluid issued upon the internal surface; and once or twice he had witnessed lenticular glands situated in the submucous tissue. Of the existence of these latter bodies he seems confident; and adds, that "they should not be rejected, because they cannot be always shown."

Two sets of glands are generally described as being present in the alimentary canal; the agminatæ, or glands of Peyer, the solitariæ, or those of Brunner. The former exist only towards the lower part of the ileum; the latter are scattered over the intestinal tube, and are found alike in the colon, the small intestine, and the stomach. It is to these last that Haller, in speaking of the lenticular glands, and referring, as he does, to Brunner's writings, probably alludes. By the majority of authors who have described the solitary glands, as Cuvier, Bichat, Billard, Elliotson, they are looked on merely as muciparous crypts, situated in greatest numbers around the pylorus, where in the kangaroo and cat tribe, they, according to Cuvier, form a separate glandular tunic of the stomach. The glands which Sir E. Home has represented as the secreting organs of the gastric fluid in man and several Mammalia, are placed in a different locality, being clustered around the cardia. In the human stomach, we learn from him, no pyloric glands exist, while the cardiac glands are tolerably distinct, though by no means so well marked as in the lynx and a number of carnivorous quadrupeds. Rudolphi, again, speaks of the pyloric glands, as being nearly a constant appearance in the stomach of man. "The glands of the stomach," he says, "show themselves in two places, *first*, at the cardiac orifice, where a number of them are scattered round the commencement of the organ; *secondly*, in the pyloric half of the viscus, which is almost entirely covered with glands. In the first situation they lie more superficially, and are seen when the muscular tunic is removed; in the second they lie much deeper in the substance of the proper membrane, as in the gullet." In the water-rat, the gastric glands are depicted by Sir Everard around the pylorus; in the hare they are shown on the great curvature; in the ass they exist on the smaller curvature; in the horse, they could not be seen, owing, Sir Everard seems to think, to the less delicate structure of the organ, though, he observes, there can be no doubt of their existence. In the elephant the gastric glands were not perceptible; in the kangaroo they were found arranged in clusters somewhat resembling the Peyerian glands, which run in three rows along the pyloric half of the stomach. In the *Ornithorhynchus hystrix*, a glandular structure surrounds the pylorus, the excretory ducts of which appear to be formed in a number of horny papillæ that project into the cavity of the stomach, and which, in Sir Everard's delineation, resemble the firm, pointed processes found in the œsophagus of the turtle.

So far as I have myself observed, the traces of glandular structure, which present themselves in the examination of the human stomach, are extremely various; occurring in some cases near the cardia, in others towards the pylorus. In a third class, a careful survey detects merely an uniform appearance of the mucous membrane, without the slightest indication of glands. Below the termination of the epithelium at the cardia, the mucous membrane may in many cases be seen elevated by small oval or globular bodies, lying in the submucous tissue, seemingly of glandular nature, but not opening by any distinguishable orifice on the surface of the stomach. Near these there commonly lies a flattened yellowish mass of variable extent, scarcely if at all projecting above the mucous surface, and marked by distinct depressions or foramina. Sometimes it exists in small separate patches, none of which are at any distance from the cardia; its appearance is decidedly glandular.

In what may be termed the body of the stomach, any well defined glandular structure is but seldom found. On the summit of the folds which run irregularly along the surface of the organ, round or oval fossæ may occasionally be observed, in all probability mucous crypts. Towards the pylorus, the glandular structure is generally better marked, and, in some cases, is exceedingly distinct. Plate II. Fig. 6. exhibits the pyloric glands in a state of very perfect developement. It is taken from a stomach in the possession of my friends Dr Sharpey and Dr A. Thomson, which, throughout the greater part of its surface, presents nothing remarkable, excepting being more than usually disposed in regular folds. About 3½ inches from the pylorus these disappear, and the surface then displays a crowded assemblage of small eminences, each about ⅛ of an inch in diameter, and marked in the centre by an orifice distinct to the naked eye. Some glandular appearances are also visible around the cardia. The stomach was taken from a young girl, who died suddenly while apparently in a state of perfect health.

In the pig, a few elevations resembling glands may be perceived, scattered here and there over the mucous surface. When best marked, they have a circular form, and the central orifice appears radiated, a circumstance observable also in the glands of the human stomach, mentioned above. Their central cavity is easily examined, and is found to exhibit the same honeycomb structure as the rest of the lining membrane. In the fourth stomach of the sheep, towards its superior orifice, oval glandular bodies visible to the naked eye are sometimes sprinkled. In the horse and calf I have not been able to distinguish any unequivocal glandular appearance. The same remark applies to the dog, in which animal I have several times examined the stomach taken from the body immediately after death, and while the process of digestion was going on. In one instance, in a cat, on applying the glass to the lesser curvature of the stomach, I was struck by observing small round elevations, crowded together, which had all the appearance of glands, and in the centre of some I even imagined that I perceived an orifice. Their situation corresponded exactly to that assigned to the gastric glands by Sir E. Home, and they appeared dark-coloured, as if congested with blood, (the animal was killed while digestion was going on,) it turned out, however, that the appearance was produced by small masses of mucus, for, on lightly applying the handle of the scalpel, they were all swept away, and the membrane beneath presented itself with the usual honeycomb structure.

It now remains to speak briefly of the bulbus glandulosus, the proventriculus, or true stomach of birds. It is generally admitted, that, from the glands which open into this cavity, the gastric fluid is secreted, and it therefore becomes important carefully to examine the structure of these organs, as from it we may fairly draw analogical inferences with respect to the structure which in the class of Mammalia performs a similar function.

Sir E. Home, the only author who notices in detail this part of comparative anatomy, dwells at greater length on the inner membrane of the gizzard, and the external form of the gastric glands, than on the internal structure of these latter organs. "In birds of prey," he remarks, "the glands have the same relative situation as in carnivorous quadrupeds;" an expression, which, coupled with another respecting the little awk, in which he observes, that "the termination of the œsophagus is only known by the ending of the cuticular lining, and beginning of the gastric glands," is somewhat opposed to his repeated assertion, that the *proventriculus* is merely a portion of the œsophagus; and also to his latest conclusion, founded on this assumption, viz. that in man the secreting organ of the gastric fluid is placed in the œsophagus. "The glands," he continues, "in carnivorous birds are placed at right angles to the membrane lining the *proventriculus*, through which are openings for excretory ducts. Their internal surface is villous."

In the common fowl, the inner surface of the glands, Sir Everard states, has a pulpy appearance. In the swan it presents a carunculated rather than a villous aspect.

A good deal has been written by the same author about the internal surface of the gizzard. Still, the question is undecided, whether this portion of the stomach is in all birds lined by a cuticular expansion; whether the varieties in its internal appearance result merely from different degrees of developement of a structure which always exists; or whether the horny layer is peculiar to some families, while in others, and in particular the purely carnivorous tribes, the lining membrane is of a strictly mucous nature. It is more easy to imagine the same essential structure existing in all, and merely modified in particular instances, than to admit a primary difference in the formation of so important an organ to occur in birds, the nature and habits of which are closely similar. For the horny layer is by no means peculiar to those birds in which trituration is essentially necessary for the digestion of their food. "In the pelican and solan goose," Sir Everard remarks, "the internal surface of the gizzard is soft and villous." In the sea-gull, again, the habits of which are similar to those of the gannet, the cuticular lining is thick and hard, and the digastric muscle is strong. In the flamingo and the sea parrot the same structure exists. In the bustard, probably a carnivorous bird, while the digastric muscle is thin, the cuticular layer is thick; in the *Ardea argala* or Adjutant bird, and in the crow, which feeds on grubs and carrion, the horny layer is also well developed.

To return to my description of the glandular part of the stomach. In the common fowl, the slightly elevated orifices of the gastric glands are sufficiently distinct. Around them, from where the epithelium terminates to where the gizzard begins, the mucous membrane is arranged in transverse folds, which run in waving lines between the openings of the glands. These again are connected by little membranous partitions, which pass from one fold to the other, and give the whole an irregular cellular appearance. As we approach the gizzard, the margins of these folds send out villous prolongations, which become more and more numerous, presenting a structure analogous to that found in man and other animals towards the pylorus. The inner surface of the gastric glands exhibits a well-marked cellular appearance, though the cells are not regular in shape, nor uniform in size; while a section of the wall of a gland displays a fibrous structure, such as is seen in the mucous layer of the stomach in man, the pig, &c. but on a smaller scale.

At the upper part of the *proventriculus* in the curlew, the lining membrane has a distinct honeycomb appearance, which continues between the orifices of the gastric glands. In the latter situation the cells become coarser, their walls are thicker, (a change more and more manifest as we approach the gizzard,) and their form less regular. The glands are simple hollow cylinders, which internally do not present the cellular appearance that might have been anticipated, but rather seem studded with very minute papillæ, in the centre of each of which there is an exceedingly minute aperture, barely perceptible when magnified 82 diameters. The perpendicular tubes are clearly seen on making a section of the gland; and the appearance of papillæ perhaps arises from these bodies opening separately into the cavity of the gland by slightly projecting orifices.

The form of the glands in the water-hen resembled that in the curlew. Each was about ⅛ of an inch in length, and their mouths, which were closely placed together, could, from their small size, scarcely be distinguished. Within, the surface did not possess the usual honeycomb structure, but presented orifices like those of the tubes in the stomach of the pig, of a round or oval form. Plate IV. Fig. 7.

Between the mouths of the gastric glands in the goose, the surface is traversed by membranous ridges similar to those in the fowl. Each gland is described by Sir E. Home as being composed of several short tubes, closed at one extremity, and opening by the other into a common duct. In the turkey and fowl such a structure exists, but in the goose each gastric gland appears a simple hollow cylinder, opening by a small aperture into the general gastric cavity. The internal surface has a cellular structure, Plate IV. Fig. 8; the cells so small that I could not discern in them the mouths of any tubes; though that such mouths existed, I have no doubt from the striated appearance, Fig. 8, presented by a section of a gland. The structure of the glands in the turkey resembles that of the glands in the fowl so closely that a separate description is unnecessary. Both the cellular and tubular structures are exceedingly distinct.

From observations so limited as these, we obviously cannot venture to draw any positive conclusion as to the source of the gastric fluid. Before we can determine this with certainty, much patient investigation, and an extensive comparison of the structure of the stomach in different animals, will be required; and, on the preceding pages, we can only found speculations to be confirmed or refuted by after research. From the circumstance of an apparatus existing in birds, the function of which was universally admitted to be the secretion of the gastric juice, it seemed but a fair inference to suppose that in Mammalia likewise a structure should be set apart for the performance of so important an office; and, since in the stomach of man and other animals glands do exist, the majority of authors, whether relying on their own observations or those of their predecessors, have expressed the belief, that in these glands the solvent liquid is formed. Where do the gastric glands present themselvs? is, however, a question to which many different answers have been returned; and the very circumstance of their being by one author referred to the œsophagus, by another, placed near the pylorus, or, it may be, towards the cardia, is certainly not easily reconcilable with the idea of their secreting a fluid essential to the process of digestion.

They have been said by Sir E. Home to exist in the œsophagus,—an assertion founded on the erroneous assumption, that in birds the glandular portion of the stomach is but a part of the œsophagus. The *lacunæ*, which in man are scattered over the internal surface of this tube, are represented as the gastric glands; while the similar *lacunæ*, which equally exist in birds, and which might with as good reason be supposed to pour out the solvent liquid, are quite forgotten.

Sir Everard's reasoning on the subject is unsatisfactory, for nothing could be more improbable than that the gastric juice should be formed out of the organ where its action is required. If, in ruminating quadrupeds, it were secreted in the œsophagus, the first, not the fourth stomach, would be the seat of the process of digestion.

At another period, it was maintained by the same anatomist, that in Man and several of the class Mammalia, the gastric juice was effused by the cardiac glands, and the action of this fluid after death, in operating chiefly on the great arch of the stomach, opposite the entrance of the œsophagus, was brought forward in support of the idea; but as at that part of the stomach the mucous membrane is thinnest, and at the same time the most dependent after death, it follows that it in particular would be acted on by the gastric fluid, from whatever source that was derived.

In the human stomach Sir Everard saw no pyloric glands. Other observers have mentioned these alone. Do the pyloric glands then secrete the gastric juice? The variety in appearance which they exhibit is opposed to such a belief. In many cases altogether absent, or at all events invisible; in some, scattered here and there over the mucous surface; in a few existing in considerable numbers,—is this compatible with the idea of their pouring out a secretion, of which the wants of the system require an uniform and never-failing supply? They are probably merely the glands of Brunner, which are well known to be extremely variable in number and appearance. They are the isolated glands described by Billard, found chiefly in the pyloric portion of the stomach; the mucous follicles mentioned by Cuvier as existing between the larger folds of the mucous membrane, and the orifices of which are more distinct towards the pylorus; the muciparous crypts, of which Elliotson speaks as the secreting organs of the mucus which covers the surface of the stomach, and which, he says, are clearly perceived about the pylorus.

It is only in the beaver, the wombat, and the manati, which possess a glandular structure peculiar to themselves, that there appears to be any organ set apart for the gastric secretion. And, even in their case, we have no positive evidence on the subject. Sir E. Home has shown that in the beaver, the glandular structure closely resembles that of the gastric glands in certain birds, so far as the arrangement of the mucous membrane is concerned; but it is probable that Cuvier would not have termed the secretion of this gland a mucilaginous fluid, nor have stated that the fluid poured out by a similar organ in the Manatus borealis resembled the secretion of the pancreas, if he had imagined that these structures were destined to secrete the solvent liquor.

In support of the opinion, that the gastric juice is effused by the general mucous surface of the stomach, it may be stated that such was the belief of Bichat, who imagined that the mucus of the stomach was secreted by the inner membrane, while the gastric juice was exhaled. Tiedemann and Gmelin, in their work on digestion, speak of no gastric glands, but mention an afflux of blood to the mucous membrane, followed by an increased secretion of the solvent acid liquor. Dr Elliotson states that the cardiac portion of the stomach is the chief seat of digestion; it is this which is found half-digested after death, and its contents are more fluid than those of the pyloric portion. He quotes also a case from Dr Philip, in which the aliment was well digested up to the day of the individual's death, in which the whole internal surface of the stomach, with the exception of its cardiac extremity, was found in a state of ulceration.

It is, however, improbable that a simple mucous expansion should perform a double office, and separate from the blood both its own mucus and the gastric juice; nor does the cellular honeycomb structure, which exists in the stomachs of so many animals, seem in any way connected with the latter secretion, inasmuch as it is not peculiar to the stomach, but occurs in other situations, in the duodenum, the colon, the gall-bladder. But if in the stomach, and in it alone, we can trace a structure essentially different from simple mucous membrane, and which, therefore, we cannot suppose to be concerned merely in mucous secretion, we may be allowed to suppose that some relation subsists between such a structure and the peculiar office of the organ in which it is found. It is possible that in the minute tubes, of which the internal layer of the stomach seems in many animals to be in great measure composed, the gastric fluid may be formed; and the conjecture is strengthened by the circumstance, that a similar formation may be traced in the gastric glands in birds, the peculiar office of which is universally admitted to be the secretion of the solvent liquor. But we are not entitled to anticipate a similar structure as we descend through the still lower classes of animals. The relation which exists between the stomach and the general system is not the same throughout, and the structure of the organ will differ in a corresponding degree. "In proportion," Dr Roget remarks, "as we descend in the scale, we find the assimilatory process more and more simplified by the concentration of organs, and the union of many offices in a single organ; till we arrive in the very lowest orders, at little more than a digestive cavity, performing at once the functions of the stomach and of the heart, without any distinct circulation of nutrient juices, without vessels, nay, without any apparent blood." Where the functions of the stomach are so complex, it may well be supposed to have a structure differing from that which it possesses when devoted to the single purpose of digestion.

If the tubular formation be not connected with the secretion of the gastric juice, the query, where is this fluid separated? still remains, more difficult perhaps of solution, but not less interesting than before; while another object of inquiry is presented; to determine, viz. what is the office of the structure in question? The mere fact of its existence is all that I have attempted to show; believing that no observation in physiology, however trifling, is altogether destitute of value; and this, though unimportant when considered singly, may perhaps assist in the elucidation of a subject confessedly obscure, when connected with observations that physiologists have already made, and those that within a few years more will probably be given to the world.

Explanation of the Plates.

Plate III. Fig. 1. Portion of epithelium in the human œsophagus while still attached; the free surface seen with papillæ: magnified 32 diameters.

Fig. 2. Epithelium removed and viewed on opaque ground; the internal surface with openings for admission of papillæ; magnified 32 diameters.

Fig. 3. Papillæ of the human œsophagus, magnified 120 diameters.

Fig. 4. Epithelium in the œsophagus of the horse detached and viewed by transmitted light; the dark specks seen corresponding to the papillæ; magnified 32 diameters.

Fig. 5. Cribriform membrane lying beneath the epithelium in the horse, viewed by transmitted light; the foramina give passage to the papillæ; magnified 32 diameters.

Fig. 6. Papillæ in the œsophagus of the horse, viewed on opaque ground; magnified 32 diameters.

Fig. 7. Cells of the human stomach, some of them partially fringed by prolongations of the mucous membrane; magnified 32 diameters.

Fig. 8. Cells of the human stomach; open mouths of tubes seen at the bottom of each; magnified 32 diameters.

Plate IV. Fig. 1. Portion of the cardiac extremity of the human

stomach; the tubes extremely short, and scattered over the mucous membrane; the honeycomb structure very imperfect, a few cells only being formed; magnified 30 diameters.

Fig. 2. Cells in the cardiac portion of the stomach of the pig, magnified 16 diameters.

Fig. 3. Section of a portion of mucous membrane from the stomach of the pig; the fibres, which are tubular, seen running perpendicularly to the surface, and forming the substance of the membrane; magnified 16 diameters.

Fig. 4. Cells in the stomach of the pig, with the mouths of tubes opening into them; magnified 32 diameters.

Fig. 5. Section of mucous membrane of the stomach in the pig after being injected; *a*, cellular tissue to which the tubes are attached, and in which the capillaries form a plexus; *b*, free extremity of the tubes; *c*, *d*, two tubes into which the injection has burst; magnified about 20 diameters.

Fig. 6. Pyloric glands of the natural size in the stomach of a girl who died suddenly when apparently in good health.

Fig. 7. Section of a portion of a gastric gland from the water-hen, showing part of internal surface and tubular structure of its parietes; magnified about 40 diameters.

Fig. 8. Section of gastric gland of the goose, showing fibrous structure of parietes and cells of internal surface; magnified 10 diameters.

Art XIV.—*On the Hemorrhagic Hepatization of the Lungs, occasionally mistaken for Pulmonary Apoplexy, and on the origin of the "Soft Pulpy Tubercle" of Bailie.* By Robert Knox, M. D., F. R. S. E., Lecturer on Anatomy, Corresponding member of the French Academy of Medicine, Fellow of the Royal College of Surgeons, and of the Med. Chir. Society in Edinburgh.

The first pathological dissection I ever witnessed was a case of that peculiar form of organic disease discovered by Dr Bailie, and described by him under the name of "the soft pulpy tubercle of the lungs." This happened twenty-six years ago; and the preparation, so far as I know, is in the Museum of the University. The case, my notes say, was treated by an active practitioner in medicine as a case of ordinary *phthisis pulmonalis*, and proving fatal at the age of about 26 the thorax was after death opened and carefully examined. All that was noted at the time, or at least all that I find in my notes, was, considerable emaciation of the body generally, and in respect to the lungs themselves, about a dozen dark-coloured masses scattered through them, some near the surface, others more deeply. The intermediate portions of lung seemed quite sound. The tubercles, as they were then named, were of different sizes, but some perhaps exceeding a walnut, and were perfectly defined. I cannot find it stated that there was hæmoptysis during life; but this must, I think, have been the case. The patient himself was well-formed; the Father rickety and diseased.

From that time to the present day I have seen but two cases of this singular morbid appearance, and under circumstances in which we could obtain no information. The one was in a private hospital in Brussels, in 1815, and the other merely a preparation now existing in the Bell collection of the Museum of the College. To this preparation, probably, the very one described by Dr Bailie, my brother had called my attention, and had asserted frequently, that what pathologists called the soft pulpy tubercle was merely masses of coagulated blood, the result, he presumed, of previous effusions of blood into the cellular tissue. * The remark fixed my attention forcibly, as including a number of deeper considerations, but no opportunity presented itself of renewing the inquiry until a few days ago when a portion of diseased lung was shown me by Dr Beilby Junior, removed by him from the chest of a person who had long laboured under and at last died of hæmoptysis. This lung, a portion of which was very kindly put at my disposal by Dr Beilby, had evidently suffered deeply from hemorrhagic effusions; but before I describe these it will be proper to sketch the case itself. I shall take the liberty of using Dr Beilby's own words. " This boy, about 14 years old, had been ailing from his tenderest years. The symptoms were not so well-marked as I believe generally occur in this affection. † There was no copious haemoptysis or expectoration of blood, which I believe generally attends pulmonary apoplexy. About three or four weeks before death the patient first complained of spitting blood in small quantity, and about the same time his cough, dyspnœa, and œdema of limbs became aggravated. These symptoms continued much the same until the time of his death, there not being any increase of the bloody expectoration. The portion of lung affected was chiefly the upper lobe of the right lung, and

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* The following is Dr Bailie's history of this organic change. " I have seen another sort of tubercle in the lungs, which I believe to be very rare. It consists of a soft tumour formed of a light-brown, smooth substance. This is not contained in any proper capsule, but adhering immediately to the common structure of the lungs. In cutting through several of these tumours I did not find any of them in a state of suppuration. They were commonly as large as a gooseberry, and were chiefly placed upon the surface of the lungs. Some, however, were scattered through their substance of a smaller size. These are very different in their appearance from the common tubercle last described." Dr Bailie adds in his section on symptoms, that " the symptoms attending the large brown tubercle are unknown to me."

† Dr Beilby considered this case as one of true apoplexy, and it was taken for such by all who saw it. I shall afterwards endeavour to show that, strictly speaking, it was not so, unless we adopt the rather vague definition of Laennec, and include under the head of " pulmonary apoplexy" all cases of mere hæmorrhagic hepatization.

a part of the middle lobe of the same was also in a state of apoplexy. The pulmonary apoplexy was of course a secondary affection, depending on the previous disease of the right side of the heart." In addition to the morbid appearances alluded to briefly in Dr Beilby's note, the following were also observed.

Heart.—The mitral valve was thickened and altered in texture, and presented that diminution in the aperture of communication betwixt the auricle and ventricle which some have called the co-arctation. This morbid structure has been supposed the cause of all the other diseased appearances: viz. 1*st*, The formation of a large clot of blood encroaching so much on the calibre of the right branches of the pulmonary artery, as to allow merely a common surgical probe to pass, and of a firmness readily suggesting the idea that the clot was of long standing. To the soundness of this opinion there are serious objections. 2*d*, A well-marked appearance of pulmonary apoplexy involving a large portion of the right lung. 3*d*, The *vena cava superior* was obliterated (a change I have now seen thrice) by fibrinous coagula. These were evidently of long standing. The right ventricle much dilated, but not much thickened, formed the apex of the heart, reversing thus the usual appearance of the organ. The tricuspid valve was thickened, and even showed some excrescences upon it. The pulmonary veins were healthy. The left auricle was dilated and thickened.

Such was my own belief as to the real nature of the morbid parenchyma, until a favourable opportunity occurred of examining the diseased lung more carefully and leisurely, with good glasses, and sufficient light, when the following changes were recognized.

Lungs.—The lung being cut across, simply showed large portions of a deep red or even purplish colour, resembling masses of venous blood, and generally circumscribed. Nothwithstanding the extreme resemblance these altered parts of the lung bore to apoplectic effusions, careful examination with a good glass totally disproved the fact of any extravasation. The tissues were hepatized, but unbroken, and much gorged with blood. From these vessels, when squeezed, fluid blood was forced out, even after the lapse of several days, and the whole appearance strikingly resembled, at first view, the *corpus cavernosum* of the *penis.* In other words, the real texture of the lung was unbroken, so that this morbid alteration did not consist in an effusion of blood into the cellular or any other texture, and could not, therefore, be likened to cerebral apoplexy. The smaller divisions of the bronchial tubes were filled with a gelatinous rose-coloured effusion, and this was present to whatever extent these tubes could be traced, with a tolerably powerful magnifying glass; but this effusion was not present in the larger divisions of the *bronchi*. The minute subdivisions of the pulmonary artery were completely filled with a very dense coagulum, as far as it was possible to trace them, and their tunics showed numerous ossified specks. The pulmonary veins were empty and quite sound.

On carefully re-examining the section of the lung when put in clear spirit, I felt inclined to conjecture that Laennec had never seen a case of real pulmonary apoplexy, and that the pathological change which he had so designated was merely a hepatization caused by the gorging of the minute branches of the pulmonary artery with blood. A suspicion arose in my mind, that Laennec had trusted to notes taken long previously, for he speaks of the pulmonary veins being sometimes engorged with blood.*

On next referring to my notes, I felt assured, on the other hand, that the disease termed by Dr Baillie, "*the soft pulpy tubercle of the lungs*," an organic change, not noticed, so far as I can observe, in the works of Laennec, Bayle, or Andral, is really the result of a pulmonary apoplexy, followed by recovery, and of which Dr Bailie had not the slightest suspicion, because in the few examples seen by him,—one or two at most,—the patients had evidently recovered from the apoplectic attack, and previous to the pathological examination, the effused blood had assumed a character, so as totally to deceive him; in other words, he had not met with a recent case which had proved speedily fatal.

This, then, is the real pulmonary apoplexy, which, I imagine, has been seen by very few persons. It consists in the effusion of blood into the common cellular tissue of the lungs, and is not merely the engorging of blood-vessels, or of the bronchial tubes. From this dangerous state, I feel assured a person may ultimately recover. This fact is perhaps new in pathology.

But I am also disposed to believe such cases to be very rare, and, moreover, that they must in general be speedily fatal. One such case is recorded by M. Cruveilhier in his splendid work on pathology, and to that I beg leave to refer the reader. Several cases are mentioned in the Cyclopædia of Practical Medicine, under the head "Pulmonary Apoplexy."

M. Bouillaud, a most distinguished pathologist, did, I find, in 1826; complain of the want of details in M. Laennec's history of this affection, and of a certain obscurity, which in consequence pervades that part of the admirable work on "Auscultation." The great reputation of Laennec will not suffer in any way by an attempt to supply these little deficiencies. It was he who gave the disease a name. If no clear case ever presented itself to him, as is my opinion, he yet perfectly comprehended the possible occurrence of such. To M. Bouillaud's memoir in the Archives de Medecine, for October 1826, I take the liberty to refer the reader.

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* This appearance, so far as I know, has not been observed by any other pathologist. In general, the pathological descriptions of that admirable writer (Laennec) are unexceptionable. The slight seeming confusion I advert in respect to his descriptions of the state of the lungs in pulmonary apoplexy, and the evident scarcity of details has, I find, been observed by others.

My principal aim in this hurried notice is to induce pathologists to re-examine the subject with more attention, and more in detail than they have hitherto done. The condition of the bronchial arteries, for example, has not yet been ascertained; neither have we any precise data for determining the effects likely to be produced by a sudden or gradual obliteration of either branch of the pulmonary artery. A distinguished pathologist, (Cruveilhier) has conjectured that the obliteration of the right or left branch of the pulmonary artery would necessarily produce gangrene of the corresponding lung; but this conjecture is at variance with the symptoms and appearances of the above case, and is, moreover, somewhat opposed to the ordinarily received physiological notions, in respect of nutrition of the pulmonary parenchyma. Physicians also would do well to study more carefully the symptoms indicating these changes in the condition of the lungs.

I have shown that a person may completely recover, at least for a while, from an attack of real pulmonary apoplexy; but as yet auscultation does not enable us to detect the effusion of blood, whether into the textures by extravasation, or when merely productive of a loading of the air-vessels and subdivisions of the pulmonary artery.

Explanation of the Engraving, Plate V.

A view of the section of the lung referred to in the preceding memoir. It exists in that part of Sir Charles Bell's museum which was purchased from him by the College of Surgeons in Edinburgh. The manuscript Catalogue contains no information further than that it is a specimen of the "soft pulpy tubercle of the lungs." I have shown these not to be tubercles, but simply extravasated blood, from which attack the patient had recovered, and lived for a considerable time afterwards.

a. a. a. Pins employed to fix the preparation, and show the sound part of the lung with the pleura entire.

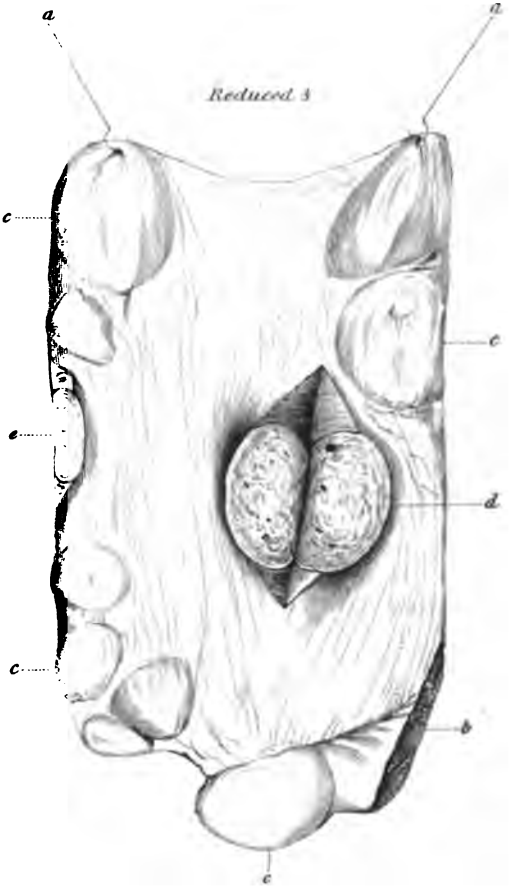
b. Section of the substance of the lung. The texture seems quite healthy.

c. c. c. Masses of coagulated blood seen through the pleura. They vary in size.

d. One of these masses cut across. It lay immediately beneath the pleura, which has also been divided by the section.

e. A smaller mass divided in a similar manner.

D^r. KNOX'S PREPARATION OF APOPLEXY OF THE LUNGS.



PART II.

CRITICAL ANALYSIS.

Art. I.—*Recherches Experimentales, &c.—Experimental Inquiries into the Functions of the Ganglionic system of Nerves and their application to Pathology.* By J. L. Brachet, Physician to the Hotel Dieu and Prison of Lyons, &c. 8vo. Paris, 1830, pp. 447.

In our last notice of this work, (Vol. xlv. p. 163,) after stating the more important doctrines of preceding physiologists* regarding the ganglionic system of nerves, we gave an abstract of M. Brachet's views of their general functions. We now proceed to examine the section containing the author's inquiry into their special functions, or the influence which they exert on the heart, lungs, stomach, intestines, bladder, organs of generation, secretions, lympathics, vision, and the passions.

To ascertain the nature of the influence exercised by different parts of the nervous system over the centre of the circulation, M. Brachet instituted experiments, 1*st*, on the *encephalon*; 2*d*, on the spinal chord; 3*d*, on the pneumogastric nerves; and 4*th*, on the ganglionic nerves.

To determine the influence of the encephalon on the heart, fourteen experiments were performed. In the first, the brain was removed by successive slices from a rabbit three months old, the annular protuberance and the cerebellum being left uninjured. The removal of the first slice produced no appreciable effect on the contractions of the heart; but, as the experiment advanced, they became rapid and irregular. During the eighty minutes which the animal lived after the termination of the experiment, the action of the heart became regular, though more rapid than usual. About twenty minutes before death took place, a jet of arterial blood issued from a wound made in the left thigh. Subsequent experiments showed that rapid remov-

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[*] We beg the reader to correct an error of the press, which occurs in the statement of Dr Alison's opinion at page 171 of the last volume. Instead of "Dr Alison maintains that the ganglionic nerves are sent," &c. it ought to have been, "Dr Alison maintains that the ganglionic nerves are *not* sent," &c.—Reviewer.

al of the whole *cerebrum* and *cerebellum* affected the circulation only temporarily; that younger rabbits and cabiais might be deprived of these and the annular protuberance without producing death, but that when the narrow part of the *medulla oblongata* was removed as deeply as possible, the animal perished from asphyxia. When the whole *encephalon* to the commencement of the spinal chord was extirpated, artificial respiration enabled the heart to act for more than fifteen minutes, with sufficient force to carry on the circulation, as shown by a jet of arterial blood proceeding from an incision made in the fore-paw. The heads of three kittens were cut off. The first perished in consequence of artificial respiration not having been kept up; but this precaution having been adopted in the case of the other two, the action of the heart continued, and after an hour had elapsed, the paw furnished arterial blood. A cabiai two days old survived for three hours, the division of the spinal chord below the occipital bone, during which artificial respiration was kept up, and might have lived longer, had it been thought necessary to prolong the experiment. Salamanders survived for several days removal of the brain, decapitation and division of the chord; and the circulation continued regular in a frog several days after the head had been removed. The effects of these experiments on voluntary motion were the same as those recorded by other observers. It is to be remarked that, in all cases, the circulation was, in the first instance, much disturbed by the mutilations to which the animals were subjected, but whenever respiration was continued, it became regular as soon as the animal recovered from the shock.

Turning to pathology, several facts will be found pointing to the same conclusion. The heart has continued to act for hours after large portions of brain have been lost in consequence of wounds of the head. In Hufeland's Journal for 1826 an account will be found of some experiments performed on six highwaymen who had been beheaded. All the bodies were opened immediately after decapitation, when the heart was found contracting and dilating with sufficient force to carry on the circulation. It was nearly half an hour before these movements gradually ceased. Irritation of a filament of the great sympathetic renewed them for a moment, but the same treatment of the spinal chord, though it caused the muscles of the trunk to contract, produced no effect on the heart. M. Brachet himself witnessed a case in which the whole *cerebrum* was carried away by the bursting of a gun. The *cerebellum* and *medulla oblongata* alone remained, yet circulation and respiration continued for half an hour. Acephalous monsters survive their birth for a longer or shorter period, and the heart continues to act in *paralysis*, convulsions, epilepsy, catalepsy, compression of the brain, and during narcotism. From these facts, M. Brachet concludes that the source of the heart's action is not to be found in the brain.

M. Brachet next considers the question of the influence exercised by the spinal chord over the heart. With the exception of some ingenious observations of Willis, the investigation of the structure, functions, and pathology of this portion of the nervous system made little progress till the inquiries of Legallois led him to consider the subject. Finding from his researches that the seat of the vital principle could not be placed in the brain, he endeavoured by a set of experiments to prove that it was to be found in the spinal chord. The novelty of his experiments, and the brilliancy of the supposed results, attracted the attention of physiologists to this part of the nervous system, and invested it with a higher degree of importance than perhaps in reality it was entitled to. M. Brachet, who was present at most of the experiments, confesses, that, like others, he was at first led away by them, and inclined to accede to the conclusions of Legallois. But when his enthusiasm gave place to reflection, some even of those experiments which had before convinced him, inspired him with doubts, and induced him to renew the investigation for himself. The following abstract will exhibit his experiments and conclusions.

When the whole spinal chord of a rabbit, cabiai, or other mammifer of a certain age was destroyed, the animal sank, and the heart never acted with sufficient regularity to carry on the circulation even when artificial respiration was kept up. The irregular contractions which occasionally occurred resembled those of the organ when torn from the body. Speedy destruction of a part of the cervical or dorsal portion of the chord was followed by the same result, but when the lumbar portion alone was injured, artificial respiration sometimes succeeded in restoring the regularity of the circulation after the animal recovered from the first shock. These experiments being unsatisfactory, in consequence of the age of the animals being unfavourable, M. Brachet instituted others on creatures newly brought into existence.

The spinal chord of a rabbit sixteen days, and of some cabiais from ten to sixteen days old, was speedily destroyed by carrying a stylet along the whole length of the canal. The result was the same as above. In the next experiment, the instrument was introduced below the occiput in the vertebral canal of a kitten two hours old, and pushed so slowly towards the caudal extremity that, at the end of half an hour, it had scarcely reached the dorsal *vertebræ*. The action of the heart continued for half an hour after the stylet was withdrawn, and one of the fore-paws having been cut off, a feeble jet of arterial blood issued from the wound, proving the continuance of the circulation. In similar experiments made on four kittens of the same age as the last, the instrument was carried with the same degree of slowness to the lower part of the dorsal portion of the chord. The circulation, though occasionally irregular, continued in the first for a quarter of an hour. The second died when the stylet reached the dorsal portion of the chord, and in the other two the action of the heart recovered by degrees its regularity, so far as to carry on the circulation. The experiment was performed with the same result on three cabiais. In three others in which the instrument was pushed as far as the sacrum, the circulation was arrested and could not be renewed.

M. Brachet's next experiments were instituted on an inferior class of animals,—salamanders and frogs. Destruction of the chord produced paralysis, but did not put an end to the circulation.

From these experiments M. Brachet infers that the source of the heart's action is not to be found in the spinal chord, and supports his opinion by a reference to the cases of monsters born without brain, *cerebellum*, and spinal chord mentioned by Wepfer, Ruysch, Littre, Morgagni, Mery, Sue, Lallemand, Bayle, Lordat, &c.

Though the heart continued to act after the brain, cerebellum, and chord had been destroyed, still, from the tumultuous manner in which it performed its functions immediately after the operation, it is clear that some sympathy exists between this portion of the nervous system and the centre of the circulation, of which M. Brachet offers the following explanation. The filaments of the pneumogastric which join the cardiac *plexus* account for the action of the brain on the heart, and the numerous filaments which establish a communication between the cervical ganglia and the spinal chord explain the influence of the latter. Thus, when an organ is affected, the cerebral nerves of the pained portion being irritated, transmit the irritation to the brain, the reaction of which on the heart accelerates the circulation. But if all communication be cut off, the heart will not suffer from irritation of the cerebro-spinal nervous centre. In support of this, he adduces two experiments. In the first, the pneumogastric nerves were cut, and a portion of each removed from a mastiff six months old, the usual precautions being taken to prevent suffocation. An hour afterwards the animal was perfectly quiet, and the heart beat regularly. On irritating the wound towards the upper part, and the superior portion of the nerve, the animal by its motions and efforts to cry showed that it suffered pain, but the motions of the heart remained uninfluenced. The cranium was then opened, and the brain lacerated. Insensibility was the result, the heart remaining unaffected. On carrying the instrument deep into the *medulla oblongata,* convulsions occurred, in which the heart did not participate. But when the stylet was plunged through the occipital foramen into the vertebral canal, respiration ceased, and after some irregular movements of the heart, the animal died. In the second experiment openings were made in the neck of another mastiff of the same age and nearly of the same size, so as to expose the pneumogastric nerves. Irritation of the wounds produced agitation and rapid contractions of the heart. In half an hour the animal became tranquil, the cranium was opened, several portions of the brain excised, and the stylet carried into the *medulla oblongata.* This last process caused the action of the heart to become strong and irregular, and the agitation continued even after section of the pneumogastric nerves. That the cause of the agitation was owing to the want of respiration is obvious from the fact, that, as soon as this was secured artificially, the action of the heart became regular, and though the instrument was plunged in all directions into the *medulla oblongata,* its regularity was not disturbed. As soon as the stylet was carried into the spinal chord the heart ceased to beat.

From these experiments M. Brachet infers that the brain is the intermediate agent in many sympathies, being first acted on and then reacting. He does not take it upon himself to affirm whether the paralysis of the heart which followed destruction of the spinal chord is to be attributed to asphyxia or not, but the rapidity with which it takes place leads him to believe that it is not occasioned by this alone.

The pneumogastric nerves are also the medium through which the heart reacts on the brain, conveying to it all those uneasy sensations which attend diseases of the heart, and that painful feeling of strangulation produced by affection of the recurrents. By the cardiac nerves, on the contrary, that pain in such cases is conveyed to the back and inferior cervical *ganglia,* whence the communicating branches convey it to the chord. By the same nerves, the chord is so much affected as to be almost paralyzed in its reaction on the muscles of respiration, whence result those wearing out fits of dyspnœa, so common in diseases of the heart.

Since the heart does not contract under the influence either of the brain, the *cerebellum,* or spinal chord, we must seek for the origin of its motions in the other portion of the nervous system, unless we adopt the opinion of Haller, and place the principle of its contraction in its organization making its fibre the type of irritability,—a view which we shall hereafter find to be altogether untenable. It has been shown that the pneumogastric nerves, the only nerves which proceed from the cerebro-spinal system to the heart, have no direct influence on its movements, because the circulation may continue for days after they have been cut. The ganglionic nerves alone remain to produce the contractions of this important organ. A conclusion is in harmony with the opinion expressed by Winslow, and elaborated by Bichat, that this portion of the nervous system presides over the organs subservient to nutrition, of which the heart is one of the most important. The doctrine, however, though thus rendered highly probable, could not be said to be fully established, because it might be objected that the ganglionic system might not exercise any greater influence over the heart than the cerebro-spinal system has been shown to do. It became therefore necessary to ascertain the truth by experiment. Two methods of proceeding presented themselves, either to destroy all the *ganglia* which furnish the cardiac nerves, or to cut these nerves near the heart. Difficult as it may appear to perform either of these, M. Brachet succeeded in both. His first attempt was unsuccessful, in consequence of the hemorrhage which supervened. In the second, instituted on a middle sized dog, the subclavian arteries were tied, the inferior cervical *ganglia* of both sides isolated, and all the nervous filaments proceeding from them cut. After some irregular contractions, the action of the heart ceased. The carotids, which were displayed, were neither coloured nor distended, and on being opened furnished only some drops of blood, but no jet. The same experiment was performed on another dog with the same result. The conclusion is obvious, that the ganglionic system presides over the contractility of the heart, and is the nervous system of the circulation. As the experiment, however, frequently failed, he repeated it several times, with occasionally the following apparently contradictory results. In some dogs the heart recovered from its first disturbance, became somewhat tranquil, and though its action was more rapid than usual, the regularity of the circulation was restored, the carotids filled and furnished a jet of arterial blood. At first M. Brachet was inclined to attribute this result to the cardiac nerve being left untouched, and communicating sufficient influence to the cardiac plexus, to enable it to maintain that regularity of action in the heart which is indispensable to the continuance of the circulation. He was therefore on the point of performing an experiment in which care should be taken to cut both the superior cardiac nerves, when he reflected that, if the *ganglia* are mutually independent of each forming a centre proper to the nerves emanating from it, the heart would continue to contract, though isolated from all the cervical and ganglionic nerves connected with it, because its ganglion, or the superior cardiac plexus, would remain uninjured. Supposing, then, this to be the case, the cardiac nerves are erroneously named, seeing that they do not reach the heart, but form merely a medium of communication between the cardiac and surrounding *ganglia*, to maintain harmony of action and the numerous sympathies of the organ. From the depth at which the cardiac *ganglion* is placed, and the important parts with which it is surrounded, it was no easy task to perform any experiment upon it. After many attempts, however, M. Brachet succeeded with the following. Two ligatures were placed on the subclavian as near as possible to its origin, and the vessel divided between them. Tracing the cardiac nerves into the chest he disarticulated the first rib at its sternal extremity, pressed it down, and by degrees reached the cardiac *plexus*, and divided it by means of a pair of scissors after he had isolated it. The circulation which had been going on the moment before was immediately arrested, the heart ceased to beat, the animal stretched itself out and died. On examination the cardiac ganglion was found to be so perfectly divided as to isolate the nervous filaments, which emanate from it in all directions to form the other cardiac plexus. The animal had lost little blood, and the pulmonary vessels were gorged with it. As the animal then could not have perished from hemorrhage, its death may be looked upon as the immediate and inevitable consequence of section of the cardiac ganglia. The same experiment was performed several times both on dogs and rabbits, and the result was invariably the same. Whenever the plexus was entirely divided, the animal instantly perished. If the plexus was only partially divided, the animal survived a short time, but generally died before the operation was finished.

The experiments of Humboldt, Home, and Weinholdt may here be cited. The first having drawn the heart out of the chest of two rabbits and a fox, and displayed and galvanised one of the cardiac nerves, observed the action of the heart become stronger and more accelerated. The same result occurred to the other two, when the great sympathetic was excited, and a galvanic current established through the medium of a thoracic ganglion, detached and inverted on the heart. From all these facts it may be concluded that the ganglionic system is the first and vital cause of the heart's action, and this conclusion is strengthened by the following facts. The nervous system commences with the cardiac ganglion, as observed by Ackermann, and before him by Malpighi, who confounded it with the spinal chord, which he looked upon as the root of the animal. The great sympathetic is developed afterwards. The heart is never without this *ganglion*, while the spinal chord is frequently wanting. Lastly, this nerve is better developed in anencephalous monsters than in well-formed fœtuses, thus proving that it is not, as Legallois mentioned, derived from the chord. The law of organogeny, by which the ganglionic is the first developed portion of the nervous system, preceding or at least co-existing with other organs, is a strong proof that it is called upon to play the first part in the nutritive or assimulating functions. The heteradelph observed by Mayer may be looked upon as corroborative of this view.

M. Brachet next examines the influence of the ganglionic system of nerves on respiration.

As soon as the child is born, and the placentary circulation arrested, the blood flows through the lungs to acquire new qualities, its presence producing a peculiar sensation denominated by the French physiologists *need of breathing*. The effect of this sensation is to impel the individual to call into action the respiratory muscles, so as to dilate the chest, and open the air cells to the atmosphere, which rushes in. Now, as the motions of the chest are directly dependent on the cerebro-spinal system, the sensation alluded to must be felt by the brain, before the respiratory muscles can be called into action. But the pneumogastric nerves alone maintain a direct communication between the brain and the lungs, and it is only through them that the sensation can be conveyed from the latter to the former, by which the respiratory muscles are brought into play. This view is supported by the following experiments performed by M. Brachet.

The pneumogastric nerves of a spaniel were cut, and the trachea opened to prevent suffocation. The breathing continued for half an hour, after which the animal was used for other experiments. M. Brachet attributes the continuance of respiration in this and similar cases, not to the need of breathing being felt, but to the habit which the cerebro-spinal nervous system had acquired of causing the respiratory muscles to move. That his explanation is correct is probable from what was observed in other experiments, yet it would have been desirable to have ascertained how long the habit will enable the cerebro-spinal system thus to continue its action.

In another dog a portion of each pneumogastric nerve was removed, and no means taken to facilitate the passage of the air into the lungs. As usual respiration became embarrassed, but the animal exhibited no signs of suffering. Though the chest dilated with difficulty, the dog made no effort to increase respiration, nor did it exhibit the same agitation as when the air-passages were simply closed. *

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* Professor Dupuy of the Veterinary School of Alfort attributes the *cornage* or roaring of horses to compression of the pneumogastric nerves.

M. Brachet's next experiments were instituted on puppies three days old. The pneumogastric nerves of the first were divided, and its mouth placed in tepid water, so as to prevent the entrance of air. The animal made no effort to raise its head, and perished from asphyxia, after some slight motions, different from those necessary for respiration. The mouth of the second was placed in tepid water, without the nerves being divided. Force was required to overcome its effort to escape, and death from asphyxia took place with convulsions. The third was placed in a bell-glass filled with air. At first it breathed freely, then more rapidly, and at last, after raising its head, opening its nostrils and mouth, it perished with all the phenomena usually attending asphyxia. The fourth, after having the eighth pair of nerves divided, was treated in the same way. It performed the motions necessary for respiration, just as if a free supply of air had been afforded it, and died in forty-six minutes, without a struggle. The fifth, after being similarly operated on, was placed under a bell-glass filled with nitrogen, and in three minutes perished without convulsions. These experiments clearly prove that the sense of the need of breathing is conveyed along the eighth pair of nerves, because, when these are cut, the presence of dark blood in the lungs is not felt, nor that uneasiness which is the effect of privation of respirable air, and the animal is asphyxiated without exhibiting any symptoms of suffering.

To investigate the matter still farther, M. Brachet removed the brain, *cerebellum*, and a portion of the *medulla oblongata*, from a rabbit ten days old. Respiration continued for five minutes. When the *medulla oblongata* was destroyed to below the attachment of the pneumogastric nerves, the breathing immediately ceased, notwithstanding a canula was kept in the *trachea*. If these nerves did not transmit the sense of the need of breathing to the brain, the motions of the chest would have continued after the destruction of that part of the *medulla oblongata*, communicating with them, because the intercostal and diaphragmatic nerves have their origin, to use the common language, in the spinal chord. In the unfortunate patient formerly alluded to, in whom the bursting of a gun carried away so large a portion of the *encephalon*, a part of the *medulla oblongata* was left entire, and the pneumogastric nerves continued their function. Monsters completely acephalous and anencephalous die in coming into the world, because these nerves have no centre to which the sensation may be communicated, and reaction produced on the respiratory muscles. In such acephalous monsters as have breathed after birth, the portion of the *medulla oblongata* to which the pneumogastric nerves are attached has always been found forming a sort of stump at the base of the cranium, and, according to Legallois, the length of time they respire depends upon the greater or less integrity of the *medulla oblongata*, and its removal from the influence of external circumstances.

M. Brachet's opinion of the influence of the cerebro-spinal system in respiration may be thus shortly stated. The pneumogastric nerves receive in the lungs the impression communicated by the presence of dark blood, transmit this impression to the *medulla oblongata*, which reacts on those parts of the spinal chord furnishing the respiratory nerves of the chest. M. Brachet believes, though he has never tried the experiment, that respiration may be rendered more or less partial, but dividing the spinal chord below the origin of the diaphragmatic nerves, and a greater or less number of the intercostals. This doctrine, though contrary to that of Legallois, who thought that the brain reacted on the lungs by means of the spinal chord and pneumogastric nerves, seems upon the whole to be well founded. The ganglionic system neither communicates to the brain and spinal chord the sense of the need of breathing, nor exerts the smallest influence over the mechanism of respiration.

M. Brachet introduces a sort of supplementary discussion, regarding the cause of death after section of the pneumogastric nerves. If the function of these nerves were merely to transmit to the brain the feeling of the need of breathing, then division would produce death only when respiration was abolished, and life might be maintained indefinitely by means of artificial respiration. Animals, however, thus treated generally perish in a few hours, though in some instances they have survived for several days. Willis attributed death in such cases partly to inanition. * Baglivi seems to have been of the same opinion, and Valsalva remarks, that besides the frequent attempts at vomiting, the digestion was deranged, the animals brought up before death a quantity of sanguineous foam, and after death the lungs were red and filled with effused blood, from which he inferred that the vomiting produced rupture of some of the pulmonary vessels. Vieussens and Senac attributed the state of the lungs less to the effusion of blood in them, than to inflammatory obstruction which might produce death by stopping the circulation. Though Haller did not overlook the affection of the respiratory organs, his attention being attracted principally to the stomach, he placed the cause of death there. Bichat attributed it to the affection of the breathing. M. Dupuytren's investigations led him to believe that death after section of the pneumogastric nerves was occasioned by *asphyxia*, and he grounded his opinion not only on the dyspnœa which takes place, but on the blood in the arteries gradually becoming darker.

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* His words are, " Quin hoc animal per plures dies superstes tam diu vixit, donec fere prælonga inedia viribus sensim attritis enecaretur."

That *asphyxia* is really the cause of death, in such cases, there can be no doubt; but it may be attributed to one of two causes :—either the atmospheric air, though penetrating into the air-cells of the lungs, does not combine with the blood so as to arterialize it, or being prevented from entering the lungs, does not come in contact with it. The effect in both cases is the same; the dispute is only regarding the mode. The first opinion was embraced by Dupuytren, the second by Dumas of Montpellier, who found that, by keeping up artificial respiration after section of the pneumogastric nerves, the blood passing through the lungs could be arterialized. He did not, however, explain how the air was prevented from gaining admission. About the same time (1808) M. De Blainville concluded from his experiments, that the operation made no difference on the respiratory function, and, like Haller, attributed death to the injury done to digestion. Yet he distinctly states that the *bronchi* were more or less filled with *mucus*, which was sometimes bloody, and that large brown spots were found in the lungs. Provençal's chemical experiments proved merely the occurrence of *asphyxia*, but not the mode in which it took place. He appears to have agreed so far with Dupuytren, but with this limitation, that the combination of the oxygen with the blood is prevented only to a certain extent by division of the pneumogastric nerves. The experiments and conclusions of Legallois were more satisfactory. They demonstrate that division of the eighth pair of nerves causes death by *asphyxia*, and that this occurs; —1*st*, from diminution of the opening of the glottis; 2*d*, from sanguineous obstruction of the lungs; and 3*d*, from effusion of a serous fluid into the *bronchi*. According to the age of the animal, death takes place from one or more of these, but generally from them all.

The probability of the justice of this view is supported by the experiments of M. Brachet. When a *canula* is not introduced into the *trachea*, after division of the pneumogastric nerves, death takes place from paralysis of the dilators of the *pharynx*, preventing the due expansion of that tube, and thereby producing *asphyxia*. He attributes the greater rapidity with which this occurs in young animals to the small size of their larynx, and its being more easily closed. When a *canula* is introduced into the trachea, death from asphyxia takes place slowly by the progressive obliteration of the air tubes, by the effusion and accumulation of a frothy fluid. At the same time sanguineous obstruction of the lungs takes place, the extent of which is in an inverse ratio to the effusion. From several experiments it would appear that pulmonary obstruction is not a necessary consequence of division of the pneumogastric nerves, because it does not always occur, and may be prevented by bleeding, yet, though this be done, death will take place. The fatal termination is attributed by M. Brachet to the effusion and accumulation of the mucous fluid in the lungs. In illustration he enters upon an explanation of expectoration, of which, as we consider it to be interesting, we shall give a brief account.

The mucus lubricating the air-passages is disposed of in two ways, being either reabsorbed or exhaled. When it accumulates its presence produces a disagreeable sensation, which is transmitted to the brain, by the reaction of which a species of expiration called cough is produced. The mechanism by which cough is produced is well known, but the mode in which the accumulated matter is evacuated is not well understood. The mode in which expectoration takes place varies according to the situation of the matter to be got rid of. When the mucus is collected in a bronchial tube sufficiently large not to be obstructed by it, the air taken in during the inspiration which precedes the cough dilates the lungs and passes behind the *mucus*. In cough the *parietes* of the chest rapidly contract, compress the lungs, and force out the air, which escapes with rapidity, and carries along with it the mucus which it may encounter in its passage. But when the *mucus* occupies the extremities of the bronchi, so that the air cannot pass behind it, it is in vain that the parietes of the chest close on the lungs, the air will be expelled without the foreign matter. Some other agent must therefore be called into operation. If Reisseissen's view be adopted, that below the mucous membrane a muscular layer is found accompanying the *bronchi* to their minutest ramifications, what occurs will be easily explained. The presence of the accumulated *mucus* conveys a disagreeable sensation to the brain through the medium of the eighth pair of nerves. By means of these nerves, the brain reacts not only on the respiratory muscles, but on the muscular fibres, at the points where the *mucus* is accumulated. These contract and force it from the tubes where it is lodged into others, which are free and distended with air, whence it is easily carried out as in the former instance. Now, supposing this hypothesis to be tenable, it will explain all the phenomena consequent upon section of the eighth pair. From several experiments M. Brachet considers himself warranted in concluding that the pneumogastric is the sensitive nerve of the lungs, transmitting to the brain, the feeling produced by the presence of dark blood in these organs, as well as any foreign body in the bronchial tubes or cells; and further, that, by means of this nerve, contraction of these tubes or cells is produced. Let these nerves be paralyzed or cut, none of the functions attributed to them can be performed. As no sensation, either of the presence of dark blood or of mucus can be conveyed to the brain, no effort will be made to get rid of them. The *mucus* continues to be secreted, gradually fills the minute cells and tubes, and prevents the admission of air as formerly. *Hæmatosis* is imperfect, the blood loses by degrees its power of stimulating the heart, obstruction takes place, the lungs become engorged, *mucus* is secreted in greater abundance, the tubes become more and more obstructed, and consequently less air is admitted.

According to M. Brachet, then, the cause of death after division of the eighth pair is the accumulation and non-expectoration of the bronchial fluid, which mechanically prevents *hæmatosis*, and gives rise to all the symptoms which precede death. The pneumogastric nerves appear to have no influence over pulmonary secretion, since, after their division, it appears to be so far from being stopped, that death seems to be the result of its increase and accumulation.

M. Brachet next attempts to explain the mode in which the blood is changed by respiration. This hypothesis, though a mere hypothesis, has the merit of ingenuity. He conceives that the oxygen of the air, instead of combining directly with the blood in the lungs, with which it is not in contact, unites with the albuminous fluid spread over the whole mucous surface of the lungs, and that this fluid being absorbed combines with the blood, and communicates to it new properties, while a portion of its serum and carbonic acid is exhaled. This view is rendered somewhat probable by the action of oxygen communicating to albuminous fluids the power of giving a vermilion tint to the blood, as well as by what takes place during fœtal life. The dark blood which reaches the placenta from the fœtus is returned red, but the placenta receives from the mother only albuminous fluids, and with these the fœtal blood combines. Now, if the necessary changes occur in the placenta without direct communication with oxygen, the same may take place in the lungs. The results of M. Brachet's experiments coincide with those of Provençal, Legallois, Brodie, Wilson Philip, &c. in showing that the chemical phenomena of respiration continue after destruction of the brain and spinal chord and division of the pneumogastric nerves. Hence, being independent of the cerebro-spinal system, they are necessarily under the ganglionic, and thus respiration exhibits to us a function performed under the joint influence of two nervous systems, each acting its separate part, but the concurrence of both being required for its due execution.

In investigating the influence of the ganglionic system of nerves in the action of the stomach, M. Brachet considers each of the operations separately. Into a detail of his various experiments we shall not enter, but give merely the results.

In opposition to Desrouelles and Broussais he attributes hunger to the irritation of the gastric extremities of the eighth pair, and satiety to the sensation communicated through the same medium to the *sensorium*. Narcotics and other medicines operate in the same manner on the brain and that organ on the stomach.

When the food has reached the stomach, two things are necessary to insure chymification, the action of the gastric juice on the mass, and the peristaltic action of the organ. When a portion of the pneumogastric nerves was removed from an animal immediately after a meal, the stomach was invariably found full and the intestines empty. Removal or narcotizing of the brain produced the same effect. Nevertheless, the surface of the alimentary mass was always well impregnated with the gastric fluids, and almost reduced to chyme. Part, however, of the process is put an end to, for the portions of the food reduced to chyme were not removed from the stomach. Sometimes when the animal fed after division of the nerves, a small portion of food was found in the duodenum, which M. Brachet attributes not to the action of the stomach having propelled it thither, but to the substances last introduced into the viscus having mechanically forced it into the gut, the stomach acting merely as an inert tube.

Sometimes a degree of regurgitation, not to be confounded with vomiting, follows division of the pneumogastric nerves. This M. Brachet attributes to the pharynx and œsophagus rejecting a portion of their contents, for it is well known that an animal thus operated on will continue to eat till these tubes be filled. Granting, however, that antiperistaltic motion does take place, it may be easily accounted for without denying that the muscular fibres of the stomach are under the influence of the eighth pair. The cut end of the nerve may be stimulated by the motions of the animal producing convulsions of the stomach and vomiting. If an artificial *stimulus* be kept up in a constant and uniform manner, as by galvanism, the action of the stomach will become regular, and the chyme when formed will be expelled from the *viscus* almost as well as before the nerves were divided. In such cases galvanism merely supplies the place of the nervous influence, which formerly stimulated the muscular fibres, and has no chemical effect in producing chymification. The artificial contractions of the stomach act in the same way as the natural, by bringing different portions of the alimentary mass in contact with the internal surface of the stomach, so as to impregnate them with the gastric juices, and by propelling the chyme into the *duodenum*.

M. Brachet objects to Magendie's doctrine, that section of the eighth pair affects the stomach only indirectly, its primary effect being on the lungs, and the suspension of digestion being but the consequence of disturbed respiration. This notion rests on the fact, that when the pneumogastric nerves are divided within the chest below where the pulmonary branches are given off, food introduced into the stomach is perfectly digested. This is undoubtedly the case, but the inference is incorrect, for, on repeating the experiment, M. Brachet found that the nervous influence is still conveyed by numerous anastomosing branches, while by inclosing the *œsophagus* in a ligature above the *cardia* and dividing it, digestion is as completely suspended as if the nerves were cut in the neck.

From the fact, that exhalation, secretion, and absorption in the stomach are independent of the eighth pair, M. Brachet considers it fair to infer, that, as they must take place under some nervous influence, it is under that of the ganglionic nerves. It would have been satisfactory had this conclusion been corroborated by direct experiment, but this he found to be impossible.

We pass over M. Brachet's observations and experiments regarding the particular influence of each of the nervous systems on the intestines and bladder. From these it would appear that the two classes of nerves with which they are supplied have each a direct and separate influence. The muscular coat of the small intestines seems to be subject to the pneumogastric nerves for a small way, and afterwards to the spinal, that of the large intestines and bladder to the latter, because when their influence was suspended or destroyed, the contractility of the muscular coat was put an end to. Absorption, secretion, and exhalation again seem to be under the influence of the ganglionic system, because these took place when the parts were fairly isolated from the cerebro-spinal nerves.

M. Brachet's investigations are next directed to the influence of the ganglionic system on generation. The part of the male in reproduction consists in furnishing a vivifying fluid, and thus his organs of generation are merely a secreting and excreting apparatus. This secretion, like all others, depends, he conceives, on the ganglionic system, because his experiments showed it to be uninfluenced by the cerebro-spinal system. To have placed the doctrine beyond all doubt, it ought to have been shown that division of the ganglionic nerves of the parts prevented secretion, but their tenuity in animals usually submitted to experiment, is such as to render the operation impossible. In corroboration of his doctrine, M. Brachet gives the case of a patient who had laboured for several years under complete *paraplegia*. Notwithstanding the insensibility of his organs, secretion, erection, and ejaculation took place as usual, but he had no sensation. In this state he became the father of two children. M. Brachet acknowledges that imagination has some influence on the process, though he is silent as to the mode in which it operates.

In the female the reproductive function is not limited to furnishing a secretion or an *ovum*, but extends to the nourishment of the *fœtus in utero* and its expulsion. The reproductive function, then, in the female consists of three acts—conception, gestation, and parturition. From direct experiments, M. Brachet concludes, that conception is quite independent of the cerebro-spinal system, though paralysis of these nerves will prevent any pleasure from sexual intercourse,—a conclusion supported by two interesting cases which he has recorded. Madame S. a very voluptuous woman, was attacked, after some rheumatic pains, with paralysis of the sentient nerves of the *rectum*, bladder, genital organs, and surrounding cutaneous parts. Sexual intercourse was no longer attended with pleasure or even sensation. The second case was that of a lady, who, after being the mother of three children, had an attack of paraplegia. The lower part of the body became completely insensible to above the pubes; connection produced no sensation, and yet she had another child. But though reproduction may take place independently of the cerebro-spinal system, the organs of generation have been wisely connected with it. Had this not been the case, the two sexes would never have thought of each other,—no process of reasoning could have led them to discover in what manner other beings like themselves could be produced, and the various races must necessarily have become extinct.

From the difficult and unsatisfactory nature of any experiments on the ovaries, no accurate information has been obtained regarding the formation of the *ovum*. The following facts, however, seem to have been ascertained concerning its expulsion. During copulation, the whole generative apparatus is thrown into action, the fimbriated extremity of the Fallopian tube is erected, and embraces the ovary, and the *ovum* or vesicle bursts the covering which connected it with the secreting organ. The separation of the ovum has generally been attributed to the fimbriated extremities of the tube grasping the ovary, and forcing the vesicle from it. When we consider, however, that the ovum is connected with the ovary by a pellicle of considerable strength, that the fringes of the fimbriated extremity, notwithstanding their formidable name of *morsus diaboli*, are too weak to rupture it, and that on pressing an ovary between the fingers, the vesicles may be ruptured, but never detached, there will appear to be some ground for concluding, with M. Brachet, that the *ovum* is expelled by the direct action of the ovary, and merely received by the fimbriated extremity of the Fallopian tube, for the purpose of being conducted to the *uterus*. It is proved by several experiments that the ovaries continue active after paralysis of the cerebro-spinal nerves. They must therefore be wholly dependent on the ganglionic system, under the influence of which also, it would appear, from the experiments of M. Brachet, that the growth of the fœtus and the increase in the bulk of the *uterus* take place.

The phenomena of parturition are complicated. We have the increased secretion of mucus, the expulsive efforts of the *uterus*, and the discharge of the *lochia*. The experiments of M. Brachet show that the first and third are under the influence of the ganglionic, and the second under that of the cerebro-spinal nerves. The case of the paraplegic lady alluded to above corroborates this view. She had no pain, the *uterus* was quite insensible, no sort of irritation having the least effect in rousing it to action. The flow of mucus was abundant; the orifice of the *uterus* was relaxed and easily enlarged in all directions; and the presentation was natural. On piercing the membranes, the waters escaped, the *uterus* closed on the fœtus, and then remained at rest. A living child was extracted, the womb slowly closed on itself, but the placenta was not detached, and had to be removed. The organ slowly recovered its ordinary size.

M. Brachet's doctrine regarding the influence of the different systems of nerves on reproduction may be thus summed up. In the male the cerebro-spinal system is the seat of pleasure and voluptuous desire, while the ganglionic system presides over the secretion and the excretion of the *semen*. In the female the former acts as in the male, with this addition, that it maintains the sensibility of the *vagina* and *uterus*, and produces uterine contractions; while the latter presides over the formation and detachment of the *ovum*, the nutrition and development of the *uterus* and *fœtus*, and those discharges which accompany and succeed parturition.

The remaining four chapters of the work we must notice briefly. In the first of these M. Brachet endeavours to show that secretion is under the dominion of the ganglionic nerves, and completely independent of the cerebro-spinal system. Many of the experiments, and much of the reasoning employed by him to establish the doctrines already alluded to, have incidentally proved the truth of this theory in regard to most of the secretions. The mucous membrane of the lungs is shown to secrete mucus after the cerebral nerves distributed to these organs have been divided. The gastro-intestinal mucous membrane continues to furnish its lubricating fluid after division of the eighth pair and spinal chord, the genito-urinary system secretes mucus, and the testicles *semen*, though altogether removed from the influence of the cerebro-spinal system. The contradictory experiments of Brodie, M. Brachet conceives, to be nullified by those of other experimentalists. To show the independence of the salivary secretion on the cerebro-spinal system, he refers to a case mentioned by M. Revoux in his thesis of 1824, of a soldier who continued to secrete saliva in great abundance after the facial nerves had been divided by a sabre cut. This, it must be allowed, is no fair induction. The glands of the opposite side as well as the sublingual and submaxillary of the affected side would continue to act. It is a much more legitimate inference, that, as other secretions are shown to be under the influence of the ganglionic system, it is not likely that this should prove an exception. The urinary secretion he shows by positive and negative experiments to be dependent in the same manner as the others on the nerves of organic life.

Though M. Brachet conceives secretion to be independent of the cerebro-spinal system, he acknowledges that it is indirectly under its influence, and this brings him to consider sympathies and the influence of the ganglionic nerves on them. For his experiments and reasoning on this interesting subject, we must refer our readers to the volume itself, in the meantime presenting them with the following abstract of his conclusions.

1. When the action of the organ primarily excited, and that of the organ secondarily implicated, both depend upon the cerebral nervous system, the communication takes place through the medium of cerebral nerves, and the sympathy is cerebral, whatever be the cerebral sensation or muscular movements which result.

2. When both actions depend upon the ganglionic system, be they secretion, exhalation, inflammation, &c. the ganglionic nerves are necessarily the medium of communication, and the sympathy is ganglionic.

3. When one of the actions depends upon the cerebral, and the other upon the ganglionic system, the sympathy is of a mixed nature.

4. When the primary excitement is applied to the cerebral system, and the sympathetic affection depends upon the ganglionic, the communication begins with the cerebro-spinal, and is

transmitted to the ganglionic system by some of their numerous anastomoses, and the sympathy may be termed cerebro-ganglionic, and *vice versa.*

The result of M. Brachet's experiments and observations on vision is, that the cerebral nervous system is the agent of the sensation of light, and of the motions of the eye, while the motions of the iris, the nutrition, circulation, and secretion of the apparatus of vision depend upon the ganglionic system.

The concluding chapter, devoted to the consideration of the passions, and the causes by which they are influenced, is divided into two sections, in the first of which he investigates their seat, and in the second the influence of the ganglionic system over them. The conclusions at which he arrives are the following. 1*st*, That the brain is the seat of the passions; 2*d*, that the trisplanchnic, influenced by the *encephalon*, reacts on other organs, and produces in them those actions which are dependent upon it; 3*d*, that the ganglionic system has no other influence on the passions, than in so far as it reflects on the brain those impressions more or less painful, which it receives from the splanchnic viscera; 4*th*, that the organs of hæmatosis and circulation exert a more direct influence over the disposition to passions, according to the quality and quantity of the blood which they send to different organs, especially to the brain; and 5*th*, that the organs which co-operate in the formation of the chyle, exercise the same influence, depending upon the quantity and quality of the chyle which they produce.

In concluding this notice of M. Brachet's work, we would observe that, though some of his notions do not seem to be established on the foundation of rigorous demonstration, the doctrines which he has advanced are upon the whole well founded. The perseverance and ingenuity with which he has pursued the investigation of one of the most obscure portions of physiology deserve great praise; and if occasionally he assumes as proved, what more extended inquiries may hereafter show to be unfounded, it is but justice to him to say, that, in by far the greater proportion of instances, the conclusions which he draws are susceptible of strict demonstration. While, however, we are bound to say this much in favour of M. Brachet, we must observe that the results of some of his experiments are so opposite to those of other experimentalists, that it would be desirable to have them repeated. We hope, therefore, that some of our British physiologists will be induced to turn their attention to this department of physiology, with the view of settling, so far as experiment can settle, the doubtful questions connected with it.

ART. II.—1. *Recherches Chimiques et Medicales, &c.—Chemical and Medical Inquiries into the Preparation, Properties, and use of Creosote.* By E. MIGUET, D. M. P. 8vo. Paris, 1834. Pp. 94.

2. *A Treatise on the Chemical, Medical, and Physiological Properties of Creosote, illustrated by experiments on the lower animals, with some considerations on the Embalment of the Egyptians, being the Harveian Prize Dissertation for* 1836. By JOHN ROSE CORMACK, Member of the Royal Medical and Royal Physical Societies of Edinburgh. 8vo. Edinburgh, 1836. Pp. vii. and 134.

IN the 41st, 42d, 43d, and 45th volumes of this Journal, notices will be found of the discovery, modes of preparation, and some of the effects of creosote. In the present article, we shall state briefly the substance of the dissertations of M. Miguet and Mr Cormack, in so far as they tend to throw light on the physiological and therapeutical effects of that substance.

" When creosote is taken into the mouth," says Mr Cormack, " it occasions violent pain, which extends to the pharynx. The pain of the tongue is extremely acute, but seldom continues more than a few minutes. The lips retain the feeling of pain much longer. For a considerable time after the pain excited in the mouth has subsided, a strong and disagreeable taste of smoke remains, and some individuals allege that they have continued to feel this for several days, after using it for toothach. Insects and fishes, when immersed in a solution of twelve drops of creosote in two ounces of water, die in about two minutes. After one or two waterings with creosote, water plants fade and die. M. Miguet watered a young and healthy rose bush, which had a number of buds and a newly expanded flower, for seven days, with a solution of creosote, and did not observe any change on its appearance, but on the eighth day it began to droop, or, as he expresses it, *son aspect etait triste*. He dropped some of the same solution on the rose, which was of a beautiful red colour, when it assumed a pale and then a yellow appearance; and he observed that the same changes were produced on the green leaves." When dropped in a concentrated state on the skin, a sensation is felt analogous to that produced by a slight burn, rubefaction takes place, and the *epidermis* cracks and falls off in small furfuraceous scales.

The effects of a fatal dose of creosote introduced into the stomach will best be shown by the following experiment of M. Miguet. Two drachms in half an ounce of water were administered to a young dog. Complete prostration of the muscular system, vertigo, stupor, dulness of the senses, difficult respiration mechanically increased by a viscid mucus obstructing the superior opening of the larynx, and producing a violent convulsive jerking cough, were the immediate effects. The respiration next became short and interrupted, and the breath hot. These symptoms were accompanied by eructations, nausea, spasms of the abdominal muscles, and vomiting of a milky matter. After the animal had remained two hours in this painful situation, the symptoms began to be aggravated; respiration became more and more laborious, the interval between expiration and inspiration longer than usual, trembling and contractions of the extremities followed, and death ensued. The body was immediately examined. All the tissues, except the liver, exhaled a strong odour of creosote, and traces of inflammation appeared almost throughout the whole extent of the gastro-intestinal mucous membrane. The matter found in the stomach coagulated *albumen*, and when exposed to heat produced a thick smoke, having the well-marked odour of creosote. The cavities of the heart contained two or three clots of red transparent blood, and this fluid in the neighbouring vessels appeared to M. Miguet to be more firmly coagulated than usual. The greater part of the lungs was gorged with brownish red blood, of a greater specific gravity than that found in the remainder, which was of a rosy colour. No symptoms of congestion nor hemorrhage appeared in the brain.

The seventh experiment of Mr Cormack exhibits the effects of creosote introduced into the stomach, in a dose not sufficient to prove fatal.

"21st December, one P. M. Thirty drops of undiluted creosote were introduced into the back part of the mouth of a small young terrier dog, all of which was apparently swallowed. He immediately exhibited signs of uneasiness, and rubbed his head violently on the ground. In three minutes a quantity of saliva, white and considerably frothed, began to issue from the mouth, and continued to flow for some time. In two minutes more he fell down. In ten minutes after the poison was administered, the breathing became much laboured, slight spasmodic twitchings affected the whole body, especially the ears and extremities, and the heart's action appeared to be feeble and fluttering; but for some time, no very accurate stethoscopic observations could be made on account of the convulsed state of the animal. In a quarter of an hour more, and in twenty-five minutes after the poison had been administered, the movements of the heart could not be felt, nor could its sounds be heard; but on applying the ear to the chest a loud bronchial *soufflet* was detected, which continued to increase for some time, and then a rattling noise was heard in the throat. This lasted for a considerable time. Though the scalpel was pushed into the tongue, (which was hanging out, stiff and cold,) legs, and other parts of the body, he gave no expression of pain. From a wound, which had penetrated one of the brachial veins, a considerable quantity of blood issued, and from this time, the dog showed evident signs of returning consciousness. the pupils became dilatable, which for a long time previously had not been the case; the eyes gradually regained their lustre, and in ten minutes after the blood had began to flow, he was observed to move his head slightly upwards. From this time, the convulsions, which had almost ceased, began to return, and rapidly became more frequent. Twenty minutes after the first signs of returning life had been observed, and in exactly an hour and two minutes from the time the creosote was swallowed, he made an unsuccessful attempt to rise, and in a few minutes afterwards, he crawled several feet. After this exertion, the breathing became again greatly laboured, and he lay for some time quite motionless. In an hour and twenty minutes from the commencement of the recovery, he was able to walk about the room, but was greatly disinclined to move. At five P. M. he refused to eat, and continued to exhibit the same disinclination to move. The breathing was almost natural. On the 22d—the following day—he ate hardly any thing, seemed very sick and dull, and could not be induced to leave the fire. During this day he had some vomiting. On the 23d, he ate and drank several times, but uniformly vomited afterwards, apparently all that he had taken. On the 24th, the vomiting continued pretty much the same as on the preceding day, but he was decidedly more lively. On the 25th and 26th, he vomited very little, and took a fair allowance of food. In a few days more, the bad symptoms had wholly disappeared, and he has ever since enjoyed the most perfect health."—Pp. 74–5–6.

As might be expected, creosote produces its deleterious effects much more rapidly when introduced into the circulation.

"The right jugular vein of an ordinary sized terrier bitch was opened about the middle of the neck. It was intended, that a drachm of pure creosote should have been introduced into the vein, and with this view, the pipette was charged with that quantity; but before two scruples had passed from the instrument, the respiration suddenly became hurried and sonorous, and the gentleman who was listening to the heart's action through the stethoscope, exclaimed '*the heart has stopped*,' and, of course, the further introduction of the substance was discontinued. For some seconds after this, the animal continued to breathe hurriedly, and before expiring uttered a faint shrill cry. When respiration had ceased, the thorax was laid open. In performing this operation, it was observed, that the muscles of voluntary motion contracted energetically when cut into. On exposing the heart, it was found to be perfectly quiescent, and its contractions could not be excited, either by pricking it with the scalpel, or making incisions into its substance. On the other hand, the œsophagus remained contractile for a considerable time; and on exposing the intestines, the vermicular motion was observed to be going on with great activity. The heart contained a considerable quantity of dark-coloured blood in all its cavities, but more in the right than in the left side. Its muscular fibre appeared flaccid. All the large veins leading to the heart were filled with partially coagulated blood, and those of the abdomen were also considerably distended. The lungs were dark-coloured from the quantity of blood which they contained, and in the bronchial tubes there was a considerable quantity of a reddish-brown, frothy, serous-looking fluid."—Pp. 66, 67.

To complete the view it is necessary to state the effects of the substance when injected into the arteries, which will be best illustrated by the following experiment.

"January 5th, twelve noon. About fifty drops of pure creosote were injected into the carotid artery of a rather large-sized sheep-dog. Before making the incision in the artery, it was tied below the place where it was intended to be opened, and as soon as the fluid had been thrown in, it was secured by means of a ligature. No sooner was the operation over than the animal sprung on his feet, and made an almost successful attempt at escape from the room, the door of which was open. He was carefully observed for about an hour, but during all this time he exhibited not the slightest sign of any functional derangement. The edges of the wound were now brought together by means of stitches, and the animal allowed to remain at rest. He was repeatedly observed during the day, and appeared uniformly quite lively. About nine P. M. he was for the first time offered food, which he ate with great avidity. He had slight attacks of vomiting for two or three days, but this affection did not continue longer, and at the end of the fifth day, when he was killed, he was in good health. On dissection, the artery was found to be firmly plugged up with a coagulum of blood, above and below the ligature, but with this exception, there was nothing apparent which could be ascribed to the experiment."—Pp. 71, 72.

From these experiments, it would appear that the first deleterious action of creosote is upon the heart itself, which it seems almost instantaneously to paralyze. Coma also occurs, but appears to be the result of the diminution or destruction of the vital energy of the heart. The other appearances observed may all be accounted for by its local action. M. Miguet does not state positively his opinion regarding the manner in which life is destroyed by this substance, but suggests that it may be by inflammation, by coagulating the blood, or by a special action on the nervous system. Upon these hypotheses Mr Cormack makes the following remarks. "The notion that creosote proves fatal by coagulating the blood is obviously incorrect, for in no case did I observe any appearance in the blood immediately after death, similar to that produced by bringing creosote in contact with it, viz. numerous white specks caused by the coagulation of the albumen; and, of course, whatever influence inflammatory action might have in the cases related by Miguet, where the animals survived some hours, in those instances in which the dogs were almost instantaneously killed by injecting creosote in the veins, no such cause can be admitted."—Pp. 86, 87.

The results of Corneliani's experiments corroborate Mr Cormack's views. Excessive doses, whether swallowed or applied to a large nerve, produced immediate death without organic lesion. Smaller doses injected into the veins produced the same effect, and if taken internally gave rise to irritation of the mucous membrane, lining the stomach and intestines. Stupor follows its inhalation.

The action of creosote on the urinary organs is very uncertain. Sometimes it augments the quantity of the secretion, and at others diminishes its amount and specific gravity. Micturition nine times in one hour was produced by a minim administered three times a-day. Strangury and remarkable changes in the colour of the urine, such as its becoming black, are phenomena which occasionally follow its use, and, like turpentine and some other substances, it rapidly communicates its odour to the urine.

On comparing the effects of creosote with those of prussic acid, many points of resemblance will be observed. Such are their producing or putting an end to vomiting, according to the dose exhibited, the transiency of their effects when they do not prove fatal, their either stopping the action of the heart, or directly affecting the brain, according to the quantity and mode of administering the substance, the lungs after death being found of a dark colour and gorged with blood, &c. In poisoning with prussic acid, the irritability of the heart is in general quite exhausted; after a fatal dose of creosote it is always so. The state of the blood is the same after poisoning with creosote as it is after a fatal dose of prussic acid. In the former case, all the tissues exhale a strong odour of the substance, which lasts for weeks. M. Miguet asserts that the liver is an exception. Mr Cormack, however, found it impossible to ascertain whether or not it was exempt from the prevailing smell. In animals poisoned with prussic acid, the odour does not continue so long, and in some cases would appear not to be perceptible at any time. When it is present, all the tissues partake of it.

According to Corneliani, oil and mucilage, when combined with creosote, render it less powerful, while vinegar has a contrary effect. Mr Cormack does not deny that oil and mucilage may modify its power, but throws some doubt on that part of the statement, which refers to the increased activity communicated to the substance by vinegar. In three comparative experiments which he made to ascertain the point, "there was no apparent difference in the activity of creosote when given with acetic acid or alone." He candidly observes, however, that "from the different strength of the animals, and from the small number of the experiments, they cannot be considered as showing more than that the addition of the acetic acid produces no very decided increase of activity. Considering that creosote coagulates albumen, it appears strange, that the addition of this substance causes it to act more forcibly than when given alone, or even with acetic acid. Yet the following experiments appear to demonstrate this to be the case.

"The two dogs, upon whom the observations were made were of an ordinary size, and seemed, from their striking similarity in every respect, to afford proper subjects for a comparative experiment. 12th January, twenty minutes before three o'clock, two drachms of pure creosote were injected by means of an œsophagus tube into the stomach; and almost immediately afterwards the white of two eggs. In six minutes after the creosote had been given, he became suddenly affected with vertigo, and fell over several times. In another minute, his breathing became laboured and sonorous, but this lasted only for two minutes, when the breathing was comparatively little affected, and could only be heard upon applying the ear to the chest, where a distinct, though not loud blowing sound was detected. For a short time, however, his breathing was so loud at intervals, as to be heard at a considerable distance. In eight minutes after the creosote was given, he was considerably affected with spasms, and in a minute and a half more fell over, and was never after able to rise. The convulsions soon became very violent, and continued so for twenty-five minutes—the animal during all this time being in a state of complete coma, from which he never recovered. It was remarked that the spasms were general over the whole body, but that the posterior extremities and the lower jaw were far most violently affected. Although the convulsions were most violent during the twenty-five minutes mentioned, yet they continued pretty strong for an hour more, when they became feeble, and occurred only at intervals. At half-past five, the body felt cold, and at first it was supposed that every mark of vitality had ceased to be apparent, but upon a close examination, slight twitchings of the lower jaw and posterior extremities were observed. In a few minutes, these also ceased to be perceptible. The cavity of the chest was then laid open, when the heart was found to be much gorged, and there was great serous congestion everywhere. The ventricles were quiescent, and refused to contract when irritated with the scalpel; but the auricles contracted at intervals spontaneously, and their vermicular motion was very evident."—Pp. 89, 90, 91.

Contrast this with the following experiment: "12th January, three P. M. two drachms of creosote, mixed with two drachms of pretty strong acetic acid, were injected into the stomach of a dog, very similar to that upon which the preceding experiment was performed. *For seventeen minutes he did not exhibit the slightest sign of uneasiness*, but in another minute he appeared giddy, and shortly afterwards fell, but rose again immediately. He continued to rise and fall alternately for six minutes, after which time he rapidly became comatose and lay in this state, and was strongly convulsed. In this case, the lower jaw was not for a long time affected, and never was much so; the spasms of the posterior extremities and abdominal muscles were most apparent. About half-past four, the breathing for the first time became laboured and sonorous. At a quarter past six, the spasms being much abated, the chest was laid open. The heart was much gorged. The auricles were observed contracting distinctly, but from a tumultuous spasmodic state into which the body was thrown upon opening the chest, by which all the viscera were heaved to and fro, it could not be decided whether the ventricles were or were not contracting. The venæ cavæ, pulmonary veins, and aorta having been tied, the heart was cut out of the body, and it was seen that the auricles were contracting at intervals of three or four seconds with considerable force, but that the ventricles were quiescent. All the vessels formerly tied were now suddenly cut through, and in this way the heart was almost instantaneously drained of blood. This caused it to contract with extreme rapidity, and so forcibly, that at each impulse it seemed as if jumping from the plate on which it was placed."—Pp. 91, 92.

Creosote, like every new remedy, has been supposed by its admirers to be quite a panacea. It has been exhibited in the most opposite complaints, as a stimulant, a tonic, a sedative, and in almost all external diseases. It may not be amiss, then, to take a rapid view of the results of its exhibition in various affections.

1. *Pulmonary diseases.*—In these affections, it has been administered both locally and generally. Reichenbach employed it in hemoptoe, curing a phthisical patient who had been spitting blood for six days, by exhibiting daily five drops for four days. "In twenty-four hours after he began the use of the medicine, the spitting of blood was subdued, the pain ceased, respiration became more easy, and the fever disappeared. In another case of a similar nature, he accomplished as striking and as rapid a cure." Reichenbach, Martin Solon of the Hospital of Beaujon, and others, have employed creosote in the form of vapour, and apparently with success. Four cases are given by M. Miguet which appear to be decided enough, but we have doubts how far the creosote contributed to the result. The observations of Wolff and Elliotson show clearly, that, when taken into the stomach in such complaints, it is positively prejudicial. "Wolff found that its use diminishes the quantity of urine, producing at the same time a greater disposition to colliquative sweats, and thus tending to complicate the original disease with dropsy. In one of his cases, the use of the creosote was discontinued on account of the violent vomiting which it produced."

Dr Elliotson's trials with it internally in phthisis were perfectly unsuccessful. In phthisical patients, whom he caused to inhale for four or five minutes, four or five times a day, the vapour arising from a mixture of creosote with mucilage and water, it produced no farther effect in general than occasionally an increased facility of respiration, and a diminution of the cough and expectoration. Some it always appeared to irritate, and especially in all those in whom inflammation existed in any degree. He believes it to be no remedy for tubercles; but in cases, in which only a small number of *vomicæ* existed in the lungs, without tendency to further formation of tubercles, it was found beneficial. In bronchorrhoea, "or that state of the bronchial mucous membrane which consists in a profuse secretion without inflammation," he found its inhalation of essential service. In asthma, also dependent upon morbid excitability of the bronchial membrane, it proved frequently useful. The result of Mr Cormack's trial of it on himself, in a pretty severe catarrh was, that it promoted expectoration. He thinks that it tended to remove the uneasiness which was before considerable.

2. *Epilepsy*, *Neuralgia*, &c.—From the variety of the causes of epilepsy, it was not to be expected that any one remedy could prove successful in all cases. In some, Dr Elliotson found creosote do positive harm, and even when beneficial, it only temporarily rendered the fits milder, and increased the intervals between them. In Neuralgia and other forms of nervous excitability, it was found to be beneficial, especially in Neuralgia which is not of an inflammatory nature. Palpitation depending upon morbid excitability of the heart was alleviated more by it than by other remedies.

3. *Diabetes*.—Three cases are given by Dr Elliotson in which creosote proved beneficial in this disease. Whether it will cure it, further experiments are required to show.

4. *Nausea*, *vomiting*, *Gastrodynia*.—It is in these cases that creosote appears to have been most useful when administered internally. "This application of creosote was accidentally discovered by Dr Elliotson, from observing that when given in cholera it arrested the vomiting, though the liquid stools, and the fatal termination of the disease were not averted. Dr Elliotson states, that he has never seen it fail in arresting vomiting when it proceeded merely from functional derangement. Dr Shortt, who has tried it in about a dozen cases of this kind, has found it equally successful, and it has proved as efficient in the hands of Dr A. T. Thomson of London, Mr Bodington of Edington, in Warwickshire, and several other gentlemen, who, I am aware, have used it in private practice, but who have not published the result of their experience."—Pp. 133–4. According to Mr Taylor, the cases in which vomiting has been checked by creosote in the practice of Dr Elliotson, are *colica pictonum*, spasmodic pain in lower part of abdomen, with great constipation and vomiting, colic with constipa-

tion and vomiting, hysteria, anasarca, ascites with supposed disease of several of the abdominal viscera, phthisis with diarrhœa, chronic bronchitis with incipient phthisis. Medicines also which produced vomiting were retained when combined with small doses of the substance. Two cases are given by Dr Bodington in which creosote proved successful in arresting vomiting. "In a severe case of vomiting, apparently from arsenic, Dr Elliotson states that he has known it succeed astonishingly, and in the limited number of cases of sea-sickness, in which he had an opportunity of trying it, the desired relief was obtained. He also prescribed it with equal benefit in a case of vomiting from pregnancy." Mr Cormack had an opportunity of trying it in a case of the last description. The effect was most extraordinary. "The patient was a woman, about forty years of age, in the family way for the thirteenth time, and who had during her three previous pregnancies been troubled with fits of vomiting, occurring generally at stated periods, two or three times a-day; and she stated, that on these three last occasions she had miscarried. Being informed of this case by a friend who had the charge of her, I requested permission to try creosote, to which he consented, stating at the same time, that he did not believe it would be of the least use. She was ordered three drops of creosote thrice a-day, diffused in water by means of mucilage. She took the first dose about an hour before her usual attack of vomiting was expected, and since that time she never vomited, and rapidly improved in health. During the first day on which she took the medicine, she had slight nausea, but that also was entirely cured in the course of a few days, by persevering in the creosote without increasing the dose."—Pp. 139.

"A patient under Dr Shortt's care in the Royal Infirmary afflicted with cancer of the stomach, derived relief from pain in ten minutes, after taking a dose of fifteen drops."

Mere gastrodynia, according to Dr Elliotson, is sometimes unrelieved by creosote, and more easily subdued by prussic acid. When gastrodynia or flatulence is united with other symptoms of derangement of the stomach, he found a combination of prussic acid and creosote to be beneficial. When either fails he advises their union.

5. *Toothach and caries of the teeth.*—Creosote has been used more in this affection than in any other. Different explanations may be given of its *modus operandi.* "1*st*, It may be by destroying the nerve. I have somewhere seen this explanation objected to upon the ground, that, were the nerve destroyed, the pain would never return. If wholly destroyed, it certainly never would; but it may be partially destroyed; for the pain often returns months after nitric acid has been applied, in which case it is more probable that the remedy acts as a caustic than by coagulating albumen. 2*dly*, The creosote may unite chemically with the

albumen of the fluids, which are always exuding from a carious tooth, and thus form a crust to protect the nervous pulp from the irritating action of the air; or *3dly*, It may perhaps afford relief by stimulating the loaded vessels of the nerve, and causing them to contract and expel the blood with which they are surcharged. That it in any case arrests the diseased action of the tooth is extremely problematical. I have seen cases in which its application completely cured the pain, but where the caries went on rapidly. The best method of introducing creosote into the diseased tooth is with a fine camel's hair pencil. When this has been done, the cavity should be filled with cotton saturated with pure creosote, care being taken that there are no adhering drops by means of which the interior of the mouth might be rendered hot and painful, and in some individuals even blistered. It is of great importance previously to clean out thoroughly the cavity. * * * The most careful attention can hardly prevent a minute portion of the substance from finding its way into the mouth; but this generally produces no other unpleasant effect than a slight burning sensation for some minutes at the top of the tongue, and a hot feeling in the mouth, and frequently in the lips, caused by the copiously secreted saliva which overflows, being mixed with a minute quantity of creosote." —Pp. 99, 100, 101. The increased secretion of the saliva may prove beneficial. In several cases in which creosote was imprudently used, we have known the teeth become brittle as it were, and break with the slightest force.

6. *Caries, whitlow*.—The cases reported by M. Reichenbach of these affections are few and unsatisfactory. The facts of Fremanger's case are these,—"A patient with scrofulous caries of the first and second phalangeal bones of the under finger, complicated with a fistulous opening into the joint, who had for ten months been using without any advantage, preparations of iodine and mercury, was speedily cured by creosote. It was for the first ten days introduced pure into the fistula by means of cotton, and afterwards an injection of five drops to the ounce of water was thrown in, for which was afterwards substituted the following ointment: Cerate one ounce, oil of sweet almonds one ounce, creosote thirty minims."

7. *Gangrene*.—One case, and that a very unsatisfactory one, is given from Reichenbach by M. Miguet. The whole skin of the thigh and the subjacent structures became gangrenous in a mason at Daubrawitz, who had his limb fractured. No symptoms are given; it is merely stated that creosote cured the affected part, though the patient never left his bed, and died of the effects of the accident.

8. *Burns and scalds*.—Reichenbach, Berthelot, and Coupel, have used it in these cases. The two last state, "That it has a remarkable tendency to cause the sores to cicatrize from the circumference to the centre, and thus prevent those irregular contrac-

tions which in so many instances produce a permanent disfiguration. A crust, in the first instance, forms on the injured surface, which spontaneously separates in a few days. In this, as in most cases of the external application of creosote, suppuration is prevented from taking place, or if it has commenced, this diseased action is arrested. It appears, then, to be an exceedingly valuable application to burns, as it prevents the two most usual bad effects of such injuries, viz. extensive suppuration and contraction of the cicatrices. Berthelot makes use of what he calls *l'eau de creosote*, which is a solution of three or four drops of creosote in an ounce of water." Reichenbach uses two parts of creosote to about a hundred of water.

9. *Cutaneous diseases*, *excoriations*, *chilblains*, *&c.* — In cutaneous diseases, Dr Elliotson found creosote useful when exhibited either internally or externally. In a case of *acne rosacea* of seven years standing, a cure was accomplished in seven months. In another of *acne indurata*, which had lasted for several years, a perseverance for six months in the use of creosote accomplished all but a cure. "Dr Copland has found a saturated solution in water answers well as a lotion in *porrigo favosa*, but most of those who have employed creosote in skin diseases seem to have ordered it in a much more diluted form. On the continent, creosote has been extensively used as an external application, in *scabies*, ringworm, *impetigo*, &c. by Reichenbach, Berthelot, and others. Professor Wolff of Berlin cured in eight weeks a case of *impetigo sparsa* of twenty-five years standing, with fomentations of creosote water. It is a very valuable application to chilblains, and may be used either in the form of lotion or ointment. Dr Hahn of Stuttgart says, that whether they be ulcerated or not, he accomplishes a cure in the course of a few days, by means of fomentations of water and creosote." Mr Cormack has seen it tried in four cases with decided success. The mixture applied consisted of equal parts of almond oil and creosote. The affected part was at the same time well rubbed with a smooth cork. Creosote in the hands of Reichenbach, Hoering, and Fichtbauer, has proved successful in mammary and infantile excoriations, as well as chops from cold.

10. *Cancer and lupus.*—Of the employment of creosote in these diseases, Mr Cormack gives the following account. "Reichenbach, Graefe of Berlin, Cloquet, and others to be noticed, state that they have employed it with great advantage. Graefe in his surgery gives a case of very extensive cancer of the face and palate which was much improved by creosote; and M. Breschet announced to the Academy of Medicine in Paris, during last year, that he had employed this remedy in a case of cancerous ulceration of the nose, in the Hotel Dieu, with great benefit. M. Tealier applied a saturated solution of creosote in water to an open cancer situated in the breast of a woman, who was suffering most excruciating pain from it, and it was with a view of alleviating this that

he employed the creosote. The result is interesting. No sooner had the solution come in contact with the ulcerated surfaces, than the patient complained of an acute burning pain in the sore, shooting through the right side of the chest, and extending from the head to the very tips of the toes. This continued for an hour, after which the pain entirely ceased, and the patient enjoyed uninterrupted sleep for ten hours. Subsequent applications uniformly allayed the pain, and under its use the sore assumed a more satisfactory appearance. The same gentleman has used it in various affections of the neck of the uterus. In one case he applied a mixture of one part of creosote to three of water to an ulcer in that situation. The pain which was immediately produced was of such a nature as to cause the woman to toss about in bed like one in convulsions. To alleviate her sufferings, he ordered injections of cold water, but the pain did not wholly leave her till the second day, when she was quite free of it, which had not been the case for two months before. The creosote was continued, but was afterwards used in a less concentrated form, and the patient was doing well, when he reported the case to the *Societé de Medecine* of Paris. These cases are interesting from the remarkable effects immediately produced, but are of little importance in enabling us to decide upon the value of creosote as a remedy in cancer, from their imperfect state. M. Marchal has published a case of cancer of the lip, in which he believes he accomplished a permanent cure by means of creosote. The ulcer had all the external appearance of cancer, and was attended with the lancinating pains so characteristic of that malady. Besides applying to its surface lint soaked in pure creosote, he occasionally touched it with caustic; and under this treatment the sore cicatrized, and the lancinating pains ceased. M. Marchal suggests the probability of the caustic inducing the ulcer more readily to take on a healing action under the use of the creosote, but ascribes to the latter the chief merit of the cure. He states that the application of the pure creosote occasioned at first very acute pain, and this is the most common occurrence, though it is by no means uniformly to be looked for. In consequence of reading the above case of M. Marchal, I was induced to try the effects of the application of pure creosote in lupus of the nose. The size of the affected part was rather less than half a sixpence, and had been very slowly increasing for about three years. Upon applying creosote to this surface, the patient experienced no uneasiness. For about a week it was dressed with lotions of creosote water, and from time to time touched with undiluted creosote. For a day or two no change seemed to take place; but after this, the parts surrounding the sore became inflamed, and at the end of the week the ulcer was decidedly larger than previous to the application of the creosote, and in consequence of the obvious injury done by the treatment it was abandoned."

"Professor Wolff of Berlin tried the effects of injections of creosote water into the vagina, in two cases of cancer of the *uterus*. In both instances, violent pain ensued, and one of the patients was obliged, on this account, after nine days, to refrain from employing it, and the other, after persevering in its use for twenty-six days, was compelled from a like cause to desist. In neither case was there any diminution of the secretion or of the metrorrhagia. One of the patients expired after violent metrorrhagi, but the other died more slowly.

"During last summer I saw it tried in the clinical wards of the Surgical Hospital by Professor Syme, in a dreadful case of lupus. The fœtor of the disharge, which was before very great, seemed to be corrected, but besides this, there was apparently no good effect produced. The case, however, was so very bad, that no application could be expected to benefit it,—the articulation of the lower jaw being exposed on one side, and an immense surface involved in the disease."—Pp. 113–17.

11. *Chronic glanders.*—A cure has been accomplished by Dr Elliotson in two cases of this disease, by injecting a solution of creosote, of the strength of one drop to the ounce, into the affected nostril. The internal use of it does not appear to hasten the cure or render it more complete.

12. *Power of counteracting the fœtor of discharges.*—This has been observed in all cases, and in this way its use is beneficial, even when the disease is not eradicated. Dr Elliotson has found advantage from impregnating clysters with it; and he and others recommend it in mercurial fœtor.

13. *Gonorrhœa.*—Drs Elliotson and Hahn have tried it in this disease both in men and women. It was of no service, and in some cases positively prejudicial.

14. *Hemorrhage.*—The styptic power of creosote seems to be generally admitted. In the experiments of Dr Hoering of Neustadt on animals, the hemorrhage from large arteries and veins was arrested in a few minutes by the application of a dossil of lint, soaked in a solution of two drops of pure creosote in a hundred of water." Profuse bleeding from a leech bite in a child was immediately arrested by the same means, by Dr Bichthauer, after other measures had proved ineffectual, and the patient was rapidly sinking. In the forty-third volume of this Journal we mentioned an experiment performed at Munich, in which the carotid artery of a dog was divided and the bleeding said to have been stopped by the application of creosote and pressure with the finger. On that occasion we hinted our incredulity. Mr Cormack, however, does not think the fact so incredible, in consequence of the following circumstance which occurred to him. "When experimenting," he observes, "upon the poisonous effects of creosote, I had occasion to inject a quantity of pure creosote into the carotid artery of a dog. The effects produced on the animal passed away in about twenty minutes, and he revived from a state of great stupefaction, and crawled

about; but to my astonishment no blood had all this time issued from the wound, not even previous to the developement of the poisonous consequences of the experiment."—Pp. 105–6.

Dr Hauff of Besigheim found injections of creosote water useful in diminishing menorrhagia. He seems to have tried it only in one case, but in that it was eminently successful after all other means had failed.

15. *Ulcers, chancres, &c.*—In scrofulous, aphthous, phagedenic, and venereal ulcers, creosote, either in solution, undiluted, or in the form of ointment, is stated to have been eminently successful. In the various continental journals numerous cases are given, and in this city it has proved successful in the hands of Dr Shortt and Dr Cumming. For the particulars of some interesting cases we must refer to Mr Cormack's work, and content ourselves with quoting his directions for applying the substance to the sores. "It is important to remember that water only dissolves one-eightieth part of creosote. If a small excess of creosote be present it will not fall to the bottom, but will float on the surface, in the form of minute globules; and when the lint to be applied to the surface is dipped in the lotion so formed, these globules adhere; and in this way a very different wash is placed on the sore from what was intended. It is sometimes proper to apply pure creosote to ulcers, but in most instances the aqueous solution of various strengths will be found to answer better; and in very few cases, where the raw surface is extensive, ought pure creosote to be used, as too severe irritation is generally the result.****When creosote is used pure, it rarely requires to be applied more than once; but if the application be repeated, it should be with caution and at intervals, lest inflammation be unexpectedly produced. More or less inflammation always follows the application of pure creosote to a raw surface, and it continues according to circumstances, from a few hours to several days. At the beginning of the treatment, creosote, either pure or in the form of lotion, should be more copiously applied than afterwards; and as soon as a healthy granulating surface appears, it may with advantage be altogether discontinued, and some of the common lotions of the metallic salts substituted.****Creosote may be applied to ulcers under various forms. **Probably, in general, the best method is to spread the lotion gently over the surface of the sore, by means of a camel's hair pencil. It may also be used in the form of ointment, and if the ulcer is irritable, this may be spread on the surface of a poultice."

In Dr Gully's improved edition of Magendie's Formulary of new medicines, the following formula for a wash is given; creosote half a drachm, gum-arabic one ounce and a half, camphor mixture ten ounces and a half; mix. Dr Shortt's lotion is as follows: creosote ten drops, vinegar two drachms, water two ounces; mix.

" To chancres creosote should be applied with a camel's hair pencil. One or two applications are frequently sufficient, and more may do harm. M. Berthelot relates a case in which a large chancre on the *glans penis*, after resisting treatment with the nitrate of silver, rapidly healed when it was dressed with lint soaked in a solution of creosote in water."

16. *Tumours, excrescences, &c.*—M. Martin Solon applied creosote successfully to a venereal bubo, which had resisted leeches, poultices and iodine. "Dr Heyfelder has removed excrescences from the anus in a fortnight, by means of creosote, after the failure of other remedies." Hahn and Fricke have found it highly beneficial in various kinds of condylomata.

17. *Diseases of the eye.*—Creosote has been tried in various diseases of this organ, sometimes without effect, occasionally prejudicially, never advantageously.

We have now laid before our readers all the information on the subject of creosote which can be looked upon as at all authentic. Of the seventeen classes of affections in which it has been tried, it will be observed that only in five can it be said to be more powerful than other remedies, and that in several it is positively prejudicial. The class of cases in which it seems to have acted most beneficially and powerfully are the 4th, *5th*, 11th, 14th, and 16th. Respecting the effects of creosote in the 9th and 15th classes of cases, we must repeat what was observed on a former occasion, that "it possesses even in the healing of sores a faculty of cicatrizing their surface, without healing perfectly the subjacent parts. We must further take the liberty of adding, that, though it possesses very considerable physiological powers, one evident result from the experiments already made is, that its therapeutic effects are exceedingly limited. We must also say, that the random and indiscriminate manner in which it has been hitherto administered in diseases of the most opposite characters, though serviceable in showing its effects on the economy, is not well calculated to render it useful as an agent in medical therapeutics.

It is now necessary to say something of the works, the titles of which are prefixed. M. Miguet's work is the least interesting of the two, though at the time of its publication it contained a complete view of all that had been ascertained on the subject. Mr Cormack's work is creditable both to his talents, his industry, and his information. If we have any fault to find, it would be with the style and arrangement, which a little care would have corrected. We have not alluded to that part of his work which contains his ingenious speculations regarding mummification, because these are foreign to the objects of this Journal. They will, however, we doubt not, be perused with pleasure by all who take any interest in such inquiries.

The book contains all that has been ascertained regarding the physical, chemical, physiological, and therapeutical properties of creosote.

ART. III.—*Clinique de la Maladie Syphilitique, &c.*—*Clinical Observations on Syphilis.* BY M. N. DEVERGIE, M.D. P. et G. CHEVALIER of the Legion of Honour, &c. *Enriched with Observations* communicated by MM. CULLERIER, Senior and Junior, BARD, GAMA, DESRUELLES, &c. &c. Paris, 1826. 1831, 2 Vols. 4to, pp. 566, and Folio Atlas of 150 coloured plates, designed and engraved from Nature, and the Collection of Wax-models prepared by M. DUPONT Senior.

IN various volumes* of this Journal, original communications and critical analyses of works devoted to the consideration of syphilis will be found, which have had no small influence in establishing and communicating those sound views entertained by the practitioners of the present day, regarding the pathology and treatment of this loathsome disease.

Though the first part of the work of M. Devergic has been nearly ten years in the hands of continental physicians, we believe that it is, comparatively speaking, unknown to the medical men of this country, and, looking upon it as we do as one of the most elaborate works on the subject, we conceive it but justice to the author and our readers to call the attention of the profession to its merits.

The first of the two volumes of letter-press, which are beautiful printed, contains a historical account of *syphilis*; an investigation of its nature; an examination of the different plans of treatment proposed for it; tables exhibiting the results of the treatment adopted by Fricke in the Hamburgh Hospital; Richond in the Military Hospital of Strasburgh; Devergie and Desruelles in the Military Hospital of Val de Grace; Delpech at Montpellier, &c. &c.; together with a comparative table of the results of the mercurial and non-mercurial treatment observed in the hospitals of Sweden, Hamburgh, Munich, Mayence, England, Rennes, Lille, Strasburgh, Paris, &c.

The opinions regarding the origin of *syphilis* may be referred to three heads; 1*st*, that it was imported from America; 2*d*, that it first appeared in Europe; and 3*d*, that it has existed in all countries and all ages.

The account given by the supporters of the first opinion is, that the disease suddenly afflicted those places where Christopher Columbus landed on his first return to Europe, such as Lisbon, Seville, Barcelona, &c.;—that it was well known in the Antilles, where the inhabitants were almost all affected with it, and that America was not free;—that among the Americans it appeared to be merely a cutaneous affection like the itch; — that the Spaniards had not the least knowledge of it before their communication with the New World;—that they contracted it by their intercourse with the native females;—that, conveyed by them to Spain, it assumed the most fearful appearance, and spread with frightful rapidity; that it was carried by the soldiers of Gonzalva de Cordova into Italy, and communicated by them to the prostitutes of Naples and Calabria, who infected the troops of Charles VIII.; ~~and~~ that in this way it spread first through Italy, then through France, and thence over Europe.

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* Vols. i. ii. iii. vi. viii. x. xi. xii. xiii. xiv. xv. xvi. xviii. & . &c.

In opposition to these assertions, M. Devergie adduces several historical facts, wholly inconsistent with their being true. As many of these have been already brought forward and considered in the thirty-third volume of this Journal, we shall notice those only which appear to be new. In the month of March 1494; and consequently before the departure of Charles VIII. for Naples, the Parliament of Paris had published an edict, excluding from the city strangers affected with "a contagious disease, called the Great Pox, *(grosse verole)* known in the kingdom for two years;" and yet only one year had elapsed since Columbus had returned. In 1162, the police regulations of London explain the measures to be taken to prevent the propagation of a detestable contagious disease, and in 1340, the writings of the English physicians mention venereal diseases. Joan, the first Queen of the two Sicilies, and Countess of Provence, published in 1347 regulations for the brothels of Avignon, and certain precautions to enable the youth to escape the disease coming *de paillardise*. An epitaph at Rome shows that the disease had been known from 1485 in the capital of the Christian world, by the name of the *Pestis Inguinaria*.

The second view, that syphilis first appeared in Europe, and the third, that it has existed in all ages and countries, are discussed at considerable length. M. Devergie brings forward the usual passages from Leviticus, Juvenal, Martial, &c., some from the Arabian physicians, and several from writers of the middle ages, not one of which throws any new light on the subject, the only legitimate inference from them being that diseases of the genitals and of the neighbouring parts have been known in all ages and all countries. Upon the whole, the question of the origin of *syphilis* is not likely to be satisfactorily answered, inasmuch as the confused pathology of former times made no very nice distinction between diseases, and frequently included under one name several, between which there existed only a very remote if not a mere fanciful resemblance. If disputes even now arise regarding the true form of the venereal ulcer, it is not to be expected that the older physicians should, with all their discrimination be able to follow this medical Proteus, as Lieutaud denominates it, through the various forms which it assumes.

The conclusions at which M. Devergie arrives are, 1*st*, That *syphilis* did not originate in America; 2*d*, That it did not exclusively begin in Europe, either at the end of the fifteenth century or at previous periods; 3*d*, That it was known in different countries even before there was much communication between nations; 4*th*, That it existed in every age, and that it is to be considered as the result of the abuse of venery, of debauchery and libertinism, rather than the product of a particular virus.

To the investigation of the nature of the syphilitic *virus*, and the questions connected with it, M. Devergie devotes some sixty pages. He criticises the definitions given of the word *virus* by Nysten, Nacquart, Dumas, Marc, and Rochoux, and after quoting a passage from Monfalcon in ridicule of the number of viruses,* proceeds to inquire whether *syphilis*, in passing from one individual to another, is always reproduced in the same form? He concludes that it does not, and grounds his opinion upon the variety of affections attacking different individuals who have connection with the same woman, of which he cites several instances.

After showing that the fact of the *lues venerea* being contagious does not prove that it arises from a virus, and that it may supervene spontaneously after coition with a party perfectly free from the disease, he quotes the experiments of Hunter, Bru, Percy, Cullerier, Lagneau, Dubled, and Richond, in favour of the view which he entertains, that there is no such thing as a syphilitic virus. The cases of three young students are given, who agreed to inoculate themselves with supposed virus, derived from one ulcer. The matter was inserted into the fore-arm. In two, a considerable ulceration occurred, where the pricks had been made, and buboes formed in the axilla, which were easily dissipated. The ulcers healed in a month or six weeks by the efforts of nature, without the smallest portion of mercury being used, or the patients being subjected to any regimen. Their health never suffered; and one of them assured M. Devergie that nothing had occurred to make him regret the experiment. In the third, the ulceration continued, and even increased under the influence of a rather severe regimen, which he observed. There were no true axillary buboes, but only swelling and sensibility of the lymphatic glands of the arm-pit. Yielding to the advice of MM. Cullerier Senior and Gilbert, he submitted to mercurial treatment. Scarcely, however, was this begun and the ulcer healed, when he put himself to death. This melancholy event was falsely attributed to the despair into which he was thrown, by the horrid effects of his experiment. On inspection, no symptom of the existence of syphilis was found. The unfortunate event M. Devergie attributed to suicidal *monomania*, of which the patient had previously exhibited symptoms sufficient to excite the fears of his friends.

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* Dictionnaire des Sciences Medicales, Tome lviii. Art *Virus*.

M. Devergie next shows that syphilis is not confined to man, but that it has appeared among the lower animals also. The experiments and observations of the veterinary surgeons of France show that animals, though rarely, are affected with venereal complaints, in consequence of excess in coition, or the employment of stimulating substances, aggravating those accidents to which the genital organs of both the male and female are liable. The medical journals of France, and the works of Fodéré, Jourdan, and Richond present us with several instances. In 1800, 1807, and 1808, in the department of the Hautes-Pyrénées, many stallions fell victims to the employment of cantharides administered internally, and applied to the penis to rouse their dormant vigour. These animals were afflicted with *blennorrhagia*, ulcerations, vesicular inflammations, *phimosis*, *paraphimosis*, infiltration of the *scrotum*, and other affections which they communicated to the mares which they covered. The veterinary surgeons of St Omer and Abbeville have also observed syphilitic affections occurring in stallions, communicated to mares. Bulls, when they couple with too great ardour, are attacked with runnings, which they transmit to cows; and dogs and bitches are subject to similar affections of the mucous membrane of the genital organs. In horses, inflammations of these parts are frequently troublesome, and followed with swelling and infiltration of the lymphatic glands, and inflammation of the testicles, capable of communicating disorders to mares.

The facts now stated we would request our readers to compare with those of a similar character adduced by Mr John Butter in the fifteenth volume of this Journal (p. 200,) and consider attentively the conclusions deduced from them by each author.

The next question which M. Devergie discusses is, can *syphilis* be cured like other inflammatory affections, and are the powers of nature sufficient to make it entirely disappear? The old doctrine, that this disease could not cease spontaneously, that the ulcers left to themselves would continue to increase, to grow worse, and produce direful effects if a stop was not put to them by some specific, has been gradually giving way before the more enlightened views of modern pathology. In support of the view, that *lues venerea* may be cured spontaneously, many facts, both ancient and modern, may be advanced. Even Astruc admits the possibility, and cases in its support are found in the older works, such as those of Fracastorius, Brassavolus, and De Hery, as well as in the more modern treatises of Lombard, Peyrilhe, Swediaur, and others. Fallopius remarked that those condemned to hard labour at the galleys were cured of *syphilis* by the labour. The fatigues of war weaken and sometimes entirely dissipate the syphilitic affections of soldiers. To the cures mentioned by Van Swieten, Capuron, and Dumas, the facts recorded by Sonnini and Bruce, the frequent admissions of M. Lagneau, and the opinion of Swediaur, may be added the decisive reasonings, observations, and experiments of Beddoes, Rollo, Scott, Cruickshanks, Blair, Ferguson, Thomson, Rose, Hill, Guthrie, Hennen, Richond, and Robillier, all proving that *syphilis* may be cured without mercury being administered in any form.

In corroboration of these views, M. Devergie gives the details of a very remarkable case, of which we can make room only for an outline. A physician, occupying a distinguished situation in one of the principal hospitals of France, and for thirteen years engaged in military service, had several attacks of various forms of venereal disease, such as *gonorrhœa*, chancres, buboes, vegetations, some of which were carefully treated, others slightly. The Russian campaign left him weakened by various diseases of the digestive organs and tormented by *lumbrici*, which took up their abode in every part of the intestinal canal. In 1803, to free himself of them altogether, he employed incessantly exciting, tonic, purgative, and oleaginous medicines. In 1814, these energetic means were doubled, and the consequences were gastro-intestinal irritation, painful digestion, and emaciation. In the beginning of the following year, copper-coloured spots invaded the skin, the throat became inflamed and ulcerated superficially, the *corona veneris* and crusted pustules appeared on the head, and shortly afterwards, night pains and swelling of the *periosteum* of that region ensued, the former extending to the lower extremities. To add to his misery, the inguinal glands were easily enlarged after walks of any length, or the wearing of tight shoes. Notwithstanding all this, the patient continued the use of a rich diet, and did not abstain from alcoholic potations and other excitants.

The symptoms just mentioned were undoubtedly those of secondary *syphilis*, as, for upwards of eighteen months, no trace of the local disease had been observed. By the advice of M. Cullerier Junior, he underwent a mixed treatment, consisting of mercurial frictions, corrosive sublimate, and sudorific syrups. In a short time all the symptoms disappeared, and perseverance would have effected a perfect cure, but after twenty-two frictions and some hundred grains of the bichloride had been used, he exchanged the treatment for a kind of life, by no means calculated to insure his restoration to health; viz. dining out, attending evening parties, and frequenting places of public amusement. His pursuits were of a laborious nature, and he often prolonged his studies to a late hour of the night. By-and-by all the symptoms reappeared; *ophthalmia* occurred in both eyes; spots took place on the skin, pustules on the *scrotum*, exudation from the *anus*, and slight pains in the right tibia, &c. The first treatment was decided to have been insufficient. Mercury was again employed to a greater extent, and strict antiphlogistic regimen adopted. The symptoms soon disappeared, but the gums were twice threatened with salivation and *aphthæ* of the mouth, inflammation of the tonsils, ulcerations of the back part of the mouth, and nocturnal pains of the joints, attributable, in M. Devergie's opinion, to the treatment adopted, continued for a long time; and six months elapsed before he was restored to health. In 1818 he married, and in fourteen months became the father of two healthy children.

After his recovery a great many venereal patients came under his care; and his personal observation, with the study of the writers on *syphilis*, changed his views regarding the treatment proper to be adopted in such cases. Success confirmed him in his opinion, that *syphilis* could be cured without mercury, and he employed that mineral, when the ordinary treatment of inflammations and ulcerations of the skin and mucous membrane was not sufficient, and the patients forced him to do so. Convinced as he was, that the primary sore could in every case be cured without mercury, and without leaving the germ of any secondary affection behind, distrusting the experiment of inoculation, and from his acting with others in the hospital, not having an opportunity of trying his plan in a proper manner, he determined to take the first opportunity of testing the truth of his doctrine upon himself. The death of his wife soon left him at liberty, and in May 1823 he had connection with an infected patient. On the sixth or eighth day two chancres appeared under the prepuce, which in six days were fully developed. At first emollient lotions were alone applied, and then the same with the addition of opium. On the twelfth day after their appearance, a lymphatic cord, sensible to the touch, extended along the left side of the *penis*, and two days afterwards, in consequence of a long walk, the glands of the groin were swollen. Moderation in walking kept the swelling stationary, and the chancres were but of moderate extent, though every evening after the labours of the day they became painful, as did the lymphatic cord, the volume of which went on increasing. During the night cataplasms diminished the irritation, and without doubt some days of rest would have caused the secondary phenomena to disappear. On the twenty-first day the sores were covered with laudable matter, granulations appeared, and the swelling of the glands went no farther. In consequence of fatigue, however, a bubo formed, which he opened with caustic. In fifteen days a small wound only remained in the groin, the chancres having healed during the developement of the bubo. In two or three weeks, his health and strength were restored.

In the course of the next year he was successively attacked with pretty severe gastro-intestinal irritation, inflammation of the tonsils, *erysipelas* of the right leg, in consequence of a blow, and some slight sores of the fingers, but no secondary affections appeared, though circumstances were favourable for their developement.

This experiment would have been by some thought sufficient; but this heroic physician determined upon another more decisive, and exposed himself to infection of the worst kind. His first attempt produced *gonorrhœa*, which soon yielded to simple treatment, and he waited for three months to destroy all susceptibility of the organs for a similar affection.

On the 3d of February 1825, he exposed himself once more to the disease by having connection with a woman in whom he had previously ascertained that vegetations existed in the *vulva*, and three well-marked chancres situated on the *labia majora* and *fourchette*. At the end of a week, two ulcers began to form behind the *glans*, produced a series of very acute inflammatory symptoms, and in ten days spread to a considerable extent. Their shape was oblong, with bleeding and everted edges, and a grayish bottom. They became very painful, and produced purulent matter of a bad quality and a fetid odour. The lymphatic vessels of the *penis* swelled, and those of the left side formed a cord of the size of a crow-quill. Leeching, baths, local and general, opiate fomentations, poultices, rest for several days, and low diet arrested the disease. At the end of the second week, the ichorous suppuration of the chancres having been allowed to remain for twenty-four hours without being cleansed, two new ulcers were produced, one on each side of the *frænum*, where the pus had settled. It was only on the twenty-first day that the first chancres began to take a favourable turn, and the swelling of the lymphatics diminished in size, while the ulcers of the *frænum* slowly increased, and ended, after sixteen days progress, in destroying the *frænum*, and forming one sore. The first two ulcers took thirty-eight days to heal, and the last nearly as long, so that fifty-three or fifty-four days passed before the traces of the infection disappeared. From the 1st of April 1825, till December 1826, twenty months elapsed, and no trace of secondary symptoms appeared. In the meantime he married again, and a healthy child was the result.

This is a most satisfactory case, showing, as it does, that the antiphlogistic treatment will have the effect of curing *syphilis* without leaving any bad symptom, while mercury, either by itself or in conjunction with the disease, produces the most frightful consequences.

M. Devergie, in discussing the questions of the possibility of recognising the presence of virus by certain signs, the existence of a general affection resulting from its absorption and the possibility of catching the secondary symptoms at first, takes occasion to expose the absurdities of many writers on this subject; and after stating the opinions of various authors regarding the period when the disease becomes constitutional, concludes, that the venereal affection has at first only a local action, which extends to different parts in succession, according to the organization of the patients and the curative means employed. The remainder of this portion of the first volume is taken up with an inquiry into the transmission of the disease from either patient to the fœtus, the affections communicated by infants to nurses, &c.

The next object which occupies M. Devergie's attention is the treatment of *syphilis*. Setting out with stating that the experience of twenty-three years, dedicated principally to the treatment of the venereal disease, has led him to doubt the existence of a syphilitic *virus*, to deny the efficacy of mercury, to see the evils which frequently attend its use, to ascertain that patients unequivocally affected with the disease have been cured without any means at all, and to cure those afflicted with the complaint by the antiphlogistic treatment, he proceeds to consider at length the various plans recommended and the various medicines employed by different physicians. Into this detail, though highly interesting, we cannot follow him, but must be content with giving his conclusions.

1*st*, That many of the substances hitherto used may be rejected as almost useless, and have no remarkable effect on *syphilis*.

2*d*, That all, in certain circumstances, cure the disease.

3*d*, That often, far from efficaciously curing the disease, they exasperate it, and produce effects more severe than those which they are employed to combat.

4*th*, That such substances do not prevent the developement of secondary affections, but are, on the contrary, favourable to it, and impress upon them a more serious character than they would have assumed if left to themselves.

5*th*, That in no case do they prevent a new infection, even when the system is under their influence, whether the symptoms have disappeared or not.

6*th*, That though reputed antisyphilitic, they possess no special or specific virtues against venereal affections, for, if they did possess them, their effect would be infallible, and would depend solely on the quantity introduced into the economy.

7*th*, That when they cure several diseases, they act revulsively by conveying to an organ at a distance from the affected one, irritation sufficiently powerful and extensive to suspend or divert the primitive irritation.

In the remainder of the first volume M. Devergie, by reasoning, authorities and documents, proves in the most satisfactory manner, that *syphilis*, both primary and secondary, may be cured by antiphlogistic means, not only as effectually as by other plans of treatment, but in a much shorter period of time.

The second volume is devoted to the consideration of each of the symptoms of *syphilis*, their distinguishing characters and proper treatment. Into this we shall not enter, as his views have already been given in a former Number. (Vol. xlv. pp. 251 and 546.)

We cannot conclude this brief notice without again observing that M. Devergie's work is, on the whole, the most complete and satisfactory treatise on the subject, containing as it does everything desirable in an historical, critical, pathological, and therapeutical point of view.

The plates are superb, and though we suspect some of them to be exaggerated, and others over-coloured, taken as a whole, they supply an amount of information nowhere else to be met with.

Art. IV.—*On the Medical Properties of the Natural Order Ranunculaceæ, and more particularly on the Uses of Sabadilla Seeds, Delphinium Staphisagria, and Aconitum Napellus, and their Alcaloids, Veratria, Sabadilline, Delphinia and Aconitine.* By A. Turnbull, M. D. Small 8vo. Lond. 1835, pp. viii. and 171.

At the 155th page of the 42d Volume of this Journal will be found a notice of a former work of Dr Turnbull, the substance of which is contained in the present treatise. We shall confine ourselves, therefore, on this occasion to an abstract of the more important parts of the new matter communicated in the volume before us, viz. those relating to the physiological effects and therapeutic applications of Delphinia and Aconitine.

Referring the reader to the 234th page of the 42d volume of this Journal for the preparation and physical characters of delphinia, we present the following account by Dr Turnbull of the effects of the administration of this alkaloid and its salts.

"Pure delphinia has little effect upon the mucous membrane of the stomach and bowels. It may be administered in some cases to the extent of three or four grains a-day, in doses of half a grain each, without exciting vomiting; in this quantity, however, it sometimes operates upon the bowels, but causes very little irritation. In most instances it acts as a diuretic, and occasions a considerable flow of pale urine. When taken to the extent of four grains, it gives rise to sensations of heat, and tingling in various parts of the body, similar to those which are produced by rubbing it upon the skin, and its other effects are very nearly the same as those of the salts of veratria. The salts of delphinia act much in the same manner, but there is nothing to give them a preference to the alcaloid itself; both have been used in the same diseases as the preparations of veratria, and appear to exercise a similar action."—P. 114.

Delphinia differs from veratria in its action on the skin. The latter "when rubbed upon the cuticle produces a strong sensation of tingling, or rather a feeling similar to that produced by receiving a succession of small electric sparks on an uncovered part of the body; whilst delphinia gives rise to a sensation of burning, not unlike that which manifests itself a short time after the application of a blister, but not to an unpleasant degree, unless the friction have been carried too far. They differ also in the duration of the effect produced, as that caused by delphinia is generally more powerful and durable, than when veratria is used.

"In the great majority of instances, veratria may be rubbed upon the skin for the usual time, without causing any great degree of redness on the part; but in almost every case, a blush pervades the surface over which the delphinia has been applied, and this continues during a length of time, varying from a few minutes to an hour or two, but in no instance, as yet observed, has it gone on to eruption. This property of stimulating the capillaries of the surface of the skin may add much to the power of delphinia, particularly in paralytic cases.

"So far as the comparative merits of the two substances have been examined, they appear to be of nearly equal value as medicinal agents, for in most instances, they seem to have the same power in removing similar diseases. There are one or two particulars, however, in which they differ, and which in certain instances may give a preference to the delphinia. The diseases in which it has been chiefly employed, are, *tic douloureux*, *paralysis*, and rheumatism. In the first of these, when the affection is seated in the tongue, or at the point where the infra-orbitary nerve escapes from its foramen, the use of the delphinia is to be preferred, because it can be applied to the tongue or rubbed on the gums without occasioning irritation of the mucous membrane,—a circumstance of great importance in the treatment of these forms of the disease. It appears also on the whole better adapted to the treatment of paralytic cases, than the veratria, but principally on account of the property just mentioned, which it possesses of exciting the circulation in the diseased part. The manner of applying delphinia is the same as that already recommended for veratria. * * * The duration of the frictions also should nearly be the same."—Pp. 115, 16, 17, 18.

At the 542d page of the 44th volume of this Journal, will be found a condensed view of Dr Lombard's experiments with the alcoholic extract of the *Aconitum Napellus*. This form of administering the substance, though less objectionable than the others, Dr Turnbull considers attended with this disadvantage, that the extract is obtained from the least active part of the plant, the root containing a much greater proportion of the peculiar properties of the aconite than any other part. "From these considerations, he observes, and from the difficulty of procuring the active principle, I was led to employ a tincture and alcoholic extract prepared from the powder of the root carefully dried."—P. 126.

Dr Turnbull agrees with other writers regarding the effects produced by aconite taken internally, but does not think, that "the benefit to be derived from this method of exhibition is at all to be compared with that which arises from its administration by the endermic method, either as regards the amount of effect produced, or the perfect safety with which in this latter mode it may be used."

In another part of this Number will be found two processes for preparing aconitine. It produces when rubbed on the skin a sensation of heat and pricking, succeeded by "a feeling of numbness and constriction in the part, as if a heavy weight were laid upon it, or as if the skin were drawn together by the powerful and involuntary contraction of the muscles beneath. This effect lasts from two or three to twelve or more hours, according to the quantity rubbed in. So small a portion as the one-hundredth part of a grain has produced a sensation that has continued a whole day; but the alcaloid, in this instance, was in a high degree of purity. The action of the aconitine upon the cutaneous vessels appear to be less than that of either veratria or delphinia; for in no case hitherto observed has it produced a greater degree of vascular excitement, than might easily be accounted for by the friction itself; and in one instance where the veratria ointment did occasion irritation, the aconitine has been employed without giving rise to any."

Dr Turnbull has employed aconitine externally, chiefly in *tic douloureux* and neuralgic affections generally, and in gouty and rheumatic cases. "It may be employed in the form of solution in alcohol, in the proportion of one or more grains to the drachm, and in ointment, made according to the following prescription: ℞ *aconitinæ* gr. ii. *Alcohol.* gtt vj. *tere optime et adde axung.* ʒj. *ut fiat unguent.* The object of adding the alcohol is to prevent the aconitine from forming a thick compound with part of the lard, which renders it difficult to make a proper ointment." The proportion of the alcaloid may be increased to four or five grains to the drachm, if necessary. In one case of unusually severe *tic douloureux*, eight grains to the drachm are stated to have been prescribed with the greatest advantage.

"The best manner of applying the ointment, is simply to rub a small part of it over the whole seat of the affection, till the pain be either for the time removed, or until the full effect upon the cutaneous nerves, above described, be brought about; and the friction should be repeated three or four times or more frequently in the day, according to the effect produced upon the disease. The proportion of the aconitine ought to be increased at every second or third friction; and the same rule elsewhere laid down in regard to the action of veratria and delphinia, also holds good in the present instance, namely, that unless the friction occasion a full developement of the peculiar impressions caused by the aconitine when rubbed on the skin, no benefit whatever is to be looked for from its employment." It ought not to be applied if there be the slightest abrasion of the skin, and it must never touch any of the mucous membranes.

For hospital and dispensary practice, Dr Turnbull recommends an ammoniated extract of aconite as being equally efficacious, though not so pleasant to the eye. The sensations in the part to which it is applied are rather more pungent; a circumstance which probably arises from the extract containing what is called the acrid principle of the plant, as well as the alcaloid itself.

Having thus laid before our readers all the new information contained in the work under consideration, we deem it but just to state, that we entertain the same scepticism regarding the efficacy of delphinia and aconitine as therapeutic agents, which we formerly expressed respecting veratria.

In conclusion, we must observe, that Dr Turnbull should not attempt to write prescriptions in Latin.

Art. V.—*Remarks on the Unity of the Body, as illustrated by some of the more striking Phenomena of Sympathy, both mental and corporeal, with a view of enlarging the grounds, and improving the application, of the Constitutional Treatment of local Diseases.* By George Macilwain, Member of the Royal College of Surgeons, Fellow of the Royal Medical and Chirurgical Society, Surgeon to the Finsbury Dispensary, &c. &c. 8vo. London, 1836, pp. xii. and 294.

The great fault of this book is the diffuse style in which it is written; a fault which is less easily overlooked in the present day, when the time of the most industrious reading man of the profession is scarcely sufficient to enable him to overtake the additional information which is daily offered him in all departments of the sciences connected with medicine. That a certain degree of diffuseness may be necessary in a lecture delivered to junior students, whose attention is called for the first time to a subject, we may be inclined to admit, but the case is altered when the lecturer assumes the character of an author, and comes forward to remove the difficulties, correct the errors, or enlighten the ignorance of his brethren. On such occasions it is, morally speaking, incumbent upon the writer to state his views with all the brevity possible which is consistent with perspicuity, and to consider every unnecessary word which he uses as tantamount to the robbing his readers of so much time and consequently of so much additional information, which they might otherwise have obtained. While we have mentioned this most striking defect of Mr Macilwain's work, we by no means intend to say that it is the only one. On the contrary, there is an endeavour made throughout to elevate common-place observations into original views, and facts of every-day occurrence into wonders, in consequence of which an individual who should commence his study of the subject with the present work, would be led to imagine that physicians were indebted for all their information in the matter to Mr Macilwain, or at least to him, his *magnus Apollo* Mr Abernethy, and Mr John Hunter, and that Hoffmann, Rega, and Whytt had never written. With these preliminary observations, we shall briefly notice the contents of the volume.

The volume consists of a preface, six chapters, an introductory discourse to some lectures on clinical surgery, a tabular view of sympathies, and a postscript. The preface and first chapter contain merely preliminary remarks of an uninteresting nature.

In the second chapter, after stating the difficulty of making a scientific classification of the sympathies of the body, Mr Macilwain divides them, for the sake of convenience, into general and particular. His description of the former we give entire, as a specimen of his style.

> "By common or general sympathy, I mean that sympathy of the whole with all its parts, demonstrated by the multiform and interesting phenomena, usually included in the term, constitutional irritation,—a sympathy peculiar to no organ, but common to every structure in the body; seen alike in primary affections of the nervous, respiratory, and circulating systems; the whole of the chylopoietic viscera, the urinary and generative organs; in glandular structures, whether absorbing or secreting organs; in skin, muscle, bone, tendons, ligament, cartilage, and in the cellular tissue, whether this be expanded into sheets of membrane, or employed in the more common office, as a connecting medium; a sympathy, which, though more marked in some instances than in others, as in the effects of teething and in symptomatic fever, is nevertheless seen in greater or less degree in almost every malady presented to the physician or surgeon. The great example of that unity to which all the sympathies contribute it is as it were the focal centre around which these sympathies revolve, and the point in which their converging influences meet for the preservation of the body; a chain connecting all parts by the particular or individual sympathies, some of which we are next to examine"—Pp. 16, 17.

In the above turgid passage, abounding in metaphor and personification calculated to mislead, we can discern nothing but an assertion of the unity of the body, which might have been clearly expressed in a single brief sentence.

Mr Macilwain divides particular sympathies into structural, functional, intermediate, those of mechanical relation, that of absorbent glands, anomalous sympathies, and those of idiosyncrasy. To this arrangement he by no means adheres, but mixes his remarks, as association by no means the most natural, seems to have connected them in his mind. The greater part of the second, the whole of the third, fourth, and fifth chapters, are devoted to a statement of facts, reasoning and opinions concerning them, exhibiting anything but lucid order.

In the sixth chapter, Mr Macilwain considers sympathy as applied to the history and treatment of disease. This, though not free from the usual defects, appears to us the best part of the work. In it Mr Macilwain is much less declamatory. The facts themselves, though neither new nor well arranged, are interesting, and may be useful to the student or junior practitioner. The cases are instructive, and calculated to make an impression on the mind of the reader, especially those illustrating the effects of the abuse of mercury in producing affections resembling *syphilis*.

The discourse which is appended to the sixth chapter was delivered as an introduction to some lectures on clinical surgery. A few copies were formerly put in circulation, and, both from its being well received, and its bearing upon the constitutional treatment of local diseases, he was induced to include it in the present volume. It contains many useful advices to students, and a vindication of the doctrines taught by Mr Abernethy.

In taking leave of this work, we would observe, that, though the views are not original, and are, moreover, as we have already remarked, clothed or rather obscured by a defective style, they appear to have been the result of much thought and observation.

ART. VI.—1. *Observations on the Local Diseases termed Malignant.* By BENJAMIN TRAVERS, F. R. S., Surgeon to St Thomas's Hospital, and President of the Medico-Chirurgical Society. Part I. and II. (Medico-Chirurgical Transactions, Vol. xv. p. 195 and 228.) London, 1829.

2. *Pathological Anatomy. Illustrations of the Elementary Forms of Disease.* By ROBERT CARSWELL, M. D., Professor of Pathological Anatomy in the University of London, &c. &c.—*Fasciculus Second and Third, Carcinoma.* Lond. 1833.—*Fasciculus Fourth, Melanoma.* Lond. 1834.—*Fasciculus Fifth, Softening.* Lond. 1834.—*Fasciculus Sixth, Hemorrhage.* Lond. 1834.—*Fasciculus Seventh,*

Mortification. Lond. 1835.—*Fasciculus Eighth, Pus.* Lond. 1835.—*Fasciculus Ninth, Hypertrophy.* Lond. 1836.—*Fasciculus Tenth, Atrophy.* Lond. 1836.

SINCE the period when we noticed the appearance of the first number of the present work, the author has made great progress in his undertaking; and has already supplied the pathological student with illustrations of the most important morbid changes incident to the organic elements of the animal body. These consist, as will be seen by the examination of the contents of the respective fasciculi or numbers of his work, of Cancer, Melanoma, or the Black Degeneration, Softening, Hemorrhage, Mortification, Suppuration, Hypertrophy, and Atrophy. Of the peculiar merits of each, we shall endeavour to take a short view. As, however, we cannot at present expect to do justice to the whole, we propose to consider the second and third numbers on *Carcinoma*, and the Essay of Mr Travers on the same subject.

Dr Carswell proceeds, in the second number of his work, to illustrate the physical and anatomical characters, and the physiological and pathological effects of those tissues to which the name of Heterologous has been applied. The distinguishing character of these growths or morbid products, it is known, consists in the presence of a fluid or solid substance, different from any of those fluids or solids which enter into the composition of the organic elements of the animal body. Thus, while tubercle and tubercular matter is chiefly a modification of albumen, with or without gelatine and fibrine, it is the character of cancer, medullary *sarcoma* and *fungus hæmatodes*, to consist principally of a substance or substances which do not enter into the composition of the organic elements of the animal body, but which present chemical characters totally different from any of those principles of which the animal tissues consist,

This distinction Dr Carswell adopts; and, agreeably to its principles, refers to the class of Heterologous Formations, the diseases designated by the following names; viz. *Carcinoma*, or the forms of cancerous disease, *Melanoma*, or the black deposit, *Pyonoma*, *Tyroma*, and *Lithoma*, or the calcareous impregnation.

Under the first, as a genus named *Carcinoma*, Dr Carswell comprehends, 1*st*, All those forms of morbid change of structure to which the general name of *Scirrhus* has been applied; 2*d*, Pancreatic, Mammary and Medullary *Sarcoma*; and 3*d*, *Fungus haematodes.* For this association of these forms of morbid product Dr Carswell assigns the following reasons. In the *first* place, however much they may differ from each other in the subsequent periods of their progress, they often present in the early periods of their formation certain common characters;

secondly, all of them terminate in the gradual destruction or transformation of the tissues which they attack; *thirdly*, all of them have a tendency to affect several organs in the same individual; and, *fourthly*, all of them possess, though in various degrees, the same reproductive character, or the faculty of producing a new animal substance similar to their characteristic matter.

Upon considering with greater minuteness the physical and anatomical characters, and physiological properties of these varieties of morbid growth, Dr Carswell finds that they present certain differences from each other, which show that they must be distinguished into subordinate species. Thus the Heterologous deposit by which chiefly they are characterized may occur in two different states. In the first it has little or no tendency to become organized; its shape and arrangement are determined chiefly by external circumstances; and its formation and subsequent growth depend on the nutritive function of the organ in which it takes place. In the second case, on the other hand, the heterologous deposit evinces a greater or less tendency to become organized; and, though the shape and arrangement which it at first assumes, may depend on external circumstances, it possesses inherent properties, by means of which its subsequent arrangement and progressive enlargement are accomplished, independent of the circulation of the organ in which it appears, except in so far as the vessels of this organ may be made to furnish the materials of its growth, which are thus diverted from the proper destination to one which is morbid, and in some degree accessory and parasitical.

Upon the principle now indicated, Dr Carswell distinguishes *Carcinoma* into two species, *Scirrhoma*, or inorganic cancer, and *Cephaloma*, or organized Cancer.

Of *Scirrhoma*, again, several different varieties are distinguished according to the relative quantity of the heterologous deposit, the manner in which it is distributed, and the difference in colour and consistence which it presents,—1*st*, When it is collected in numerous points in the form of hard, gray semitransparent matter, intersected by a dull-white or pale straw-coloured fibrous or indurated cellular tissue, it constitutes the form usually denominated *Scirrhus*. 2*d*, When it assumes a regularly lobulated arrangement, so as to present when divided an appearance similar to a section of the *pancreas*, it constitutes that variety of malignant tumour named by Mr Abernethy pancreatic *sarcoma*. 3*d*, It may be disseminated uniformly through the texture of an organ, which it thus converts into a firm substance resembling raw or boiled pork; it constitutes the lardaceous tissue of the French. 4*th*, *lastly*, It may assume the appearance of firm jelly, and be collected in masses of different sizes in numerous cells, and it then constitutes the Colloid or glue-like matter of Laennec, or the Gelatiniform or Areolar cancer of M. Cruveilhier.

The physical and anatomical characters of these several forms of morbid production, with their effects on the organs attacked, are beautifully and accurately illustrated in the first, second, third, and fourth plates of the second number, and in the first plate of the third number. From the specimens represented by these delineations it appears that the scirrhous, lardaceous, and mammary forms of heterologous growth may exist in the different tissues of the same organ (Plate I.;) that the scirrhous structure may pass to that of mammary *sarcoma*, the mammary to the medullary, and the latter to the hæmatoid fungus, and that the scirrhous, lardaceous, mammary, medullary fungoid and hæmatoid structures may be all combined in one organ, Plate II. fig. 3. It further appears, from the first figure of the fourth engraving, that the cerebriform or encephaloid tumour is merely a more advanced stage of that which was previously the lardaceous or mammary structure, and that the principal circumstance in the progressive transition from the latter to the former condition is the developement of new vessels, the effusion of blood or bloody serum, and the liquescence or softening of the matter of the tumour by the admixture of these fluids with it.

To the head of *Cephaloma*, or that form of cancer presenting the tendency to organization, Dr Carswell refers the following varieties. The *first* is, when the heterologous deposit presents the appearance of firm coagulable lymph or fibrine deprived of the red colouring matter of the blood, and possessing a uniform fibrous or lobulated arrangement, with a certain degree of transparence and vascularity, constituting the common vascular or organized *sarcoma* of Mr Abernethy. In this case, the heterologous deposit is generally accumulated in a mass more or less bulky, in which few or no traces of the proper substance of the affected organ are recognized. In the *second* case, the heterologous deposit may be uniformly disseminated through the texture of an organ, and thus convert it into a substance resembling a section of the mammary gland, or the udder of the cow when boiled, constituting the mammary *sarcoma* of Mr Abernethy. In the *third* case, the character of the tumour seems to be derived chiefly from the colour and consistence by which it is distinguished, the former being generally some variety of light or pale-red, and the latter being soft and pulpy. This variety, according to Dr Carswell, corresponds to the medullary *sarcoma* of Mr Abernethy, the cerebriform or encephaloid matter of M. Laennec, the *Spongoid Inflammation* of Mr Allan

Burns, the milt-like tumour of the elder Dr Monro, the *soft cancer* of various authors, and, as to one organ, the pulpy testicle of Dr Baillie. As the latter variety of the disease is that in which traces of vascular organization are most distinct, and as the coats of the vessels distributed through the new substance are extremely delicate, their circulation is readily interrupted, congestion and hemorrhage ensue, and the extravasated blood is often mixed with the brain-like product, so as to form a soft blood-coloured fungous mass. This circumstance has induced Mr Hey and Mr Wardrop to apply to this variety of *Cephaloma* the distinctive appellation of *Fungus Haematodes*, and Sir Astley Cooper that of *Fungoid Disease*.

The distinctive characters of these varieties of *Cephaloma*, as contrasted with those of scirrhoma, are very happily illustrated in the second plate of the third number of the present work.

It must not be imagined, notwithstanding the distinctions now established, that it is always practicable to recognize them with facility in all cases of heterologous deposits, and the disorganization thence resulting. The circumstance already mentioned of the occurrence of the scirrhous and lardaceous structures on the one hand, and the mammary, medullary, and fungoid on the other, in the same organ, and the transition from the former to the latter, with other circumstances of the same description, adduced by Dr Carswell himself, show that it is not always easy to distinguish the varieties of *Scirrhoma* from those of *Cephaloma*; and that occasionally a form of tumour, which at one stage of its progress must, according to the distinction of Dr Carswell, belong to *Scirrhoma*, will at a subsequent stage of its career, refer itself to the head of *Cephaloma*. Thus, while the first figure of the second plate of number second represents the transition of scirrhous to mammary *sarcoma*, of mammary to the medullary, and of the latter to the hematoid, while Dr Carswell refers the mammary, the medullary, and the hematoid equally to the head of *Cephaloma*, it clearly results that *Scirrhoma* must, in certain cases, as in the preparation from which the delineation now given is taken, become at an ulterior stage of its progress *Cephaloma*. From this fact it would further result, if the other distinctions regarding the respective absence or presence of organization in each be well founded, that the tumour, which at one period presents few or no traces of organization, may, at a subsequent period, give very distinct indications of this quality. These difficulties Dr Carswell candidly admits, and states them in the following terms.

"But although I have said that the essential difference between the two species consists in the former having little or no tendency, the latter (*Cephaloma*) a greater or less tendency to become organized, it is by no means always easy, nay, it is sometimes impossible, to draw a distinct line of separation between them; for the heterologous deposit, when first formed, and, indeed, for a considerable time after its formation, does not furnish us with any signs, which show that it will or will not become organized. We cannot determine what these properties are, by means of which it is afterwards to assume a definite arrangement, or to possess within itself the powers of contributing to its subsequent developement. These facts may be illustrated by the two following circumstances: 1*st*. The heterologous deposit may exist, as I have described it, in the form of *scirrhus*, pancreatic *sarcoma*, or the lardaceous tissue, without its presenting any trace of organization; the textures which invades being gradually destroyed by its presence, and both ultimately converted into a soft, granular, pulpy or liquid mass, of the colour or consistence of cream or milk. 2*d*, The same deposit may exist under the same forms as those I have just named; but it undergoes changes of an opposite kind, that it is to say, it assumes the characters of the mammary or medullary *sarcoma*, becoming more or less soft and vascular, and frequently terminating in hemorrhage by the rupture of its vessels, or in that state called *fungus hæmatodes*."

To the same effect Dr Carswell afterwards continues in the following manner.

" Numerous examples might be given of *scirrhus*, medullary *sarcoma*, and *fungus hæmatodes*, as they are commonly called, originating in the same morbid state, and passing successively from the one into the other in the order in which I have named them. Indeed, we often meet with all the varieties which I have enumerated of both species, not only in different organs of the same individual, but even in a single organ. And of so much importance does it appear to me to establish this fact, that the coloured representations of *Carcinoma* in the present fasiculus have been given almost exclusively with this view. If such are the successive changes observed to take place in *carcinoma*, the distribution of the disease into species and varieties may be considered by some to be of little importance. Such, however, cannot be the case, for we know that the curability of a disease often depends on the time at which a remedy is employed, or varies with the state or period of the disease; and, therefore, it is obvious that, whatever means may be adopted for the cure of *carcinoma*, we can form no precise opinion as to the relative efficacy, unless the particular condition or variety of the disease be kept in view. And it is far from being an unimportant fact, that several of the varieties of both species of *carcinoma* differ materially from one another, as regards the comparative rapidity of the developement, as well as their reproductive tendency. Thus, in both these respects, the pancreatic differs from the lardaceous, the lardaceous from the mammary, and the mammary from the medullary *sarcoma*; the first often remaining stationary for a long space of time, months or years; the last frequently acquiring its maximum of bulk in a few weeks, and when removed being sometimes reproduced with a degree of rapidity, which is never observed in any of the other varieties. It may be said, that the more the varieties of both species of *carcinoma* partake of the characters of the analogous formations, viz. the cellular, cellulo-fibrous, and fibrous tissues, they are *cæteris paribus* the less rapid in their developement, and the less in their tendency to be reproduced."

These observations demonstrate the extreme difficulty of framing distinctions among the several forms, in which carcinomatous disease may present itself, and prove either that we have not yet collected a sufficient number of these varieties to enable the pathologist to form a correct classification, or that the subject of malignant heterologous growths is one which, in its complicated, multifarious, and diversified ramifications, bids defiance to the artificial restraints of the systematic nosologist. From the classification now proposed one evil results. We allude to the circumstance that, though Dr Carswell refers proper cancer and *fungus hæmatodes* to the respective heads of *Scirrhoma* and *Cephaloma*, it is, nevertheless, a natural result of his principles now stated, that the former passes into the latter; and we are thus at one blow deprived of all those diagnostic marks, between these two diseases hitherto believed to be distinct, which have been taught by the most able and experienced masters in the profession. To this inconvenience, however, we shall make no objection, if it be subsequently confirmed by the facts of pathology and morbid anatomy.

Carcinomatous matter, Dr Carswell proceeds to inform his reader, when traced in its mode of origin, may be either a product of nutrition or of secretion. In the former case, it is deposited as the nutritive element of the blood, in the molecular or interstitial structure of the tissue or organ in which it is found. In the latter case it is deposited on the free surface of a membrane, after the manner of a secretion.

The mode in which the carcinomatous matter is deposited in the molecular structure of organs, Dr Carswell finds to be most easily observed in the progressive occupation of the liver and stomach with this heterologous deposit.

In the former organ it first affects one or more *acini*, in which its presence banishes the red or orange-colour natural to these bodies, and substitutes a pale milk-white or straw tint, with an increase in their degree of consistence. The shape and size of the *acini*, in the meantime, however, remain unaltered; and this circumstance, with the change in colour and consistence, must be regarded, Dr Carswell observes, as a satisfactory proof, that the foreign substance or heterologous matter is introduced into their substance in the same order, and by the same channel as the normal element of nutrition,—of which, in this morbid state, it then becomes the representative.

As the *acini* are thus transformed into the heterologous matter by their coalescence, they form groups of three, four, ten, or twenty, the junction of which forms tumours varying in size from that of a hemp seed to that of a cherry or an apple. At a more advanced stage of the process, the natural structure of the liver having entirely disappeared, with further coalition of the smaller tumours, the whole is converted into a uniform lardaceous mass, or into one or other of the substances belonging to either of the species of *carcinoma.*

In the instance of the stomach, the progressive deposition of the heterologous matter is most easily seen in the muscular coat, the fibres of which become pale, and more firm and consistent than natural. The progress of these changes is well illustrated by the first, second, and third plates of the second number.

The deposition of heterologous matter by secretion, Dr Carswell admits to be a distinction more nominal than real. The free surfaces, in which the deposits are observed most usually to take place, are those of the *pleura* and *peritonæum.* As they may be, and often are, deposited on these surfaces in the form of tumours, varying in size from peas to cherries, and from the volume of a plum to that of an orange, and consisting of matter resembling pork, the mammary gland, brain, or a mixture of brain, fibrine, and blood, yet without any cognizable change in the surface or substance of the membrane on which they are deposited, the author arrives at the conclusion, that the source of these heterologous products is the blood, and that from this fluid they are deposited in the manner of a secretion. He, therefore, argues, that their appearance in the situation now specified cannot depend upon any local cause, and that it is only reconcilable with the idea of a general impregnation of the blood with the matter secreted.

Having in this manner proved the *existence* of carcinomatous matter in the blood, in cases in which it is deposited in the free surfaces of the serous membranes, Dr Carswell argues that it not only exists but is also formed in that fluid; and as strong evidence of the justice of this conclusion, he adduces the following facts. 1*st,* Carcinomatous matter is found within the vessels which ramify in carcinomatous tumours, or in their immediate vicinity. 2*d,* Carcinomatous matter is found in the vessels of a portion or of the whole of an organ, to the former of which the substance is exclusively confined, and may be traced from the trunks into the branches and capillaries. 3*d,* That it is found in vessels having no direct communication with an organ affected with the same disease, as, for instance, when it is confined to a small extent of the *vena portae*. And *fourthly* and *lastly*, that carcinomatous matter is found in blood which has been effused into the cellular tissue, and on the surface of organs.

The absence of carcinomatous matter in the arteries, and its presence in the veins and capillaries, Dr Carswell thinks is to be ascribed to the contractile power of the former vessels, preventing, under ordinary circumstances, the blood from accumulating, and consequently this substance from being deposited among them, and not to any peculiarity of function exercised by the former.

These circumstances lead Dr Carswell to maintain the facts of the carcinomatous deposition being dependent upon a general cause affecting the whole constitution, and to oppose the idea that it is a disease depending on local causes, or on the affection of a certain order of tissues, or any modification of structure or organization, as has been attempted by several pathologists. He consequently does not admit its greater liability to take place in one kind of organic texture more than another, unless in so far as its deposition from the blood may become more prompt and easy in one tissue or organ than another. This view shows in what manner we are to understand what has been named the cancerous diathesis.

The readers of this Journal are aware, from the account of the able essay on adventitious structures, by Dr Hodgkin, given in the thirty-fourth volume of this Journal, (p. 164,) that the dissections of that physician led him to maintain, that scirrhous medullary sarcoma and *fungus haematodes*, are formed by an aggregation of pedunculated cysts, subsequently converted into tubercle, with more or less consistence in their contents. As this hypothesis implies in the formation of heterologous formations the previous existence of cysts, a cystiform arrangement in the part or parts about to be attacked by the carcinomatous deposition, and appears to be at variance with the doctrines promulgated by Dr Carswell, the latter author, admitting the fact of a cystiform arrangement in several instances of cancer, contends, however, that there is here no new principle or any thing irreconcilable with the mode in which he represents heterologous deposits to take place. Cysts, he observes, are merely a modification of a serous membrane; and if such cysts be developed in an individual already impressed with the carcinomatous diathesis, or whose blood is impregnated with cancerous matter, it is not difficult to perceive that this matter may be as readily deposited at the internal surface of these cysts, as at the free surface of the serous membranes. Dr Carswell, however, further contends, that carcinomatous tumours do not always originate in cysts. They may be formed, he thinks, in the cellular tissue exterior to the cysts, and during their growth or enlargement project inwards, carrying before them, as their common envelope, the internal and serous lining of the latter. This conclusion, Dr Carswell thinks, results from the views given by Dr Hodgkin himself of the relative position of the cysts, and their arrangement in the tumours dissected by him. They are found in the fifteenth volume of the Medico-Chirurgical Transactions, p. 437 and 438, Plate IV. and V.

Dr Carswell further thinks that the hypothesis advanced by Dr Hodgkin implies the doctrine of the local origin of these heterologous tumours. This we do not perceive to result from the hypothesis of the latter gentleman; and though we do not pretend to know whether Dr Hodgkin contemplated such a conclusion, yet we should think that he never could have meant that it was to be deduced from the views given by him. It is doubtless the fact, that at the 57th page of his essay, he does not express his opinion as to the previous existence of the constitutional diathesis, in terms sufficiently explicit. But we conceive it would be impossible for any one, whatever opinion he may entertain of the local origin of cancer, to believe, in opposition to the multiplied facts daily observed by physicians and surgeons, that such diseases as medullary sarcoma, or *fungus hæmatodes*, depended on any other than a general cause pervading the whole constitution. In all other respects, it appears to us, that the hypothesis of the cystiform arrangement of heterologous tumours is not at variance with the doctrine of previous *diathesis*, since it is quite as easy to imagine the *diathesis* to be capable of producing cysts, as to be capable of producing any other new or heterologous substance.

To the arrangements and theories proposed by Mr Abernethy, M. Andral, and M. Cruveilhier, Dr Carswell is equally opposed. The first he regards as objectionable, because it assigns to the tumours an origin which cannot be proved of all; and of his arrangement he disapproves, as one which assigns to some of the growths fictitious characters, while it confounds under the same head diseases essentially different and even opposite. The criticism is severe, but within certain limits it is well founded. It is to be observed in extenuation, however, that, next to the classification proposed by Professor Plenck, which Mr Abernethy himself states he had not seen, the Essay on Tumours was the first attempt in modern times to classify these parasitical growths upon accurate anatomical characters, and the approved principles of modern pathology. The errors and defects of that classification we are enabled to recognize, chiefly by means of the lights which its author supplied.

The same indulgence cannot be extended to M. Andral, whose method of arrangement is still more justifiably condemned by Dr Carswell, as established on characters not founded on fact, and as even violating the principles of his own classification. It is certainly a remarkable proof of the illogical characters of the distinctions of M. Andral, that he classes accidental serous and cellular tissue with the heterologous products of *Scirrhus* and *Fungus hæmatodes*, and a proof not less remarkable of his disregard to precision, that he maintains that scirrhus is an organized tumour.

The opinion of Cruveilhier, that these morbid products are seated in the *cellular element* of the proper tissue, and not in organs, Dr Carswell also controverts, as at variance with the facts adduced and illustrated in the engravings of the present work.

In the present observations on the origin and nature of carcinomatous tumours, Dr Carswell makes no allusion to the views of Mr Travers, which were published previously to those of Dr Hodgkin in the first part of the same volume of the Medico-Chirurgical Transactions. It must of course be matter of opinion whether it come within the limits of the plan adopted by the author to advert to all or even the majority of the opinions entertained on any given subject; but as the observations of Mr Travers turn very much upon the question of the local or general character of cancerous diseases, and as they appear to us to afford one of the most satisfactory modes of reconciling the discordant opinions maintained by different pathologists, we think it might have been desirable, to possess on this point the thoughts of one, who has seen so many varieties of heterologous structure as Dr Carswell has done. It may not be improper, in the meantime, to notice briefly the views entertained by Mr Travers, and to consider to what extent they accord with those held by the partizans of each side,—the local or the constitutional origin of cancer.

We must begin with remarking, that, whatever may be speculatively the pathological principles of different surgeons, the practice of all of them leads to the conclusion, that they regard scirrhus and cancer as, at first and for a very long time, a disease entirely local. It is of no use here to talk of exceptions to general rules, modifications of the disease, constitutional taint, and similar philosophical, but evasive, explanations. If there be any necessary connection between principles and practice, then, so long as the surgeon instructs his pupils, that he must extirpate by the knife all cancerous tumours which are situate in parts admitting of excision, it is quite clear that he acts on the presumption, that the disease is confined to the single locality in which it is observed; that it affects no other region, tissue, or organ; and that when so removed, there is no reason to apprehend that it will return. To the views of these pathologists the principles explained by Dr Carswell are completely opposed.

It cannot be denied, on the other hand, that instances of the recurrence or the reappearance of disease denominated cancerous by skilful surgeons, have been several times observed; and that several surgeons maintain that it is useless to remove many instances of cancerous tumours apparently local. Nor can it be denied that instances of external and apparently local scirrhus or cancer have been observed, in which it was afterwards found that one or more internal organs were affected with the same deposit at the time, or soon after the time of its external appearance. The facts of this class, on the other hand, are highly favourable to the views of Dr Carswell.

It must be further observed, in the *third* place, that there is a class of tumours which may be called carcinomatoid, which all skilful and experienced surgeons admit, betray a very uniform tendency, not only to affect several organs and regions of the body simultaneously and successively, but to recur with redoubled violence and irresistible rapidity, when removed. Tumours of this class, all good surgeons have long agreed, should not be made the subject of chirurgical operation, not only because such operation must be unavailing, but because the irritation and disorder necessarily caused by operation enfeebles the constitutional powers, and facilitates the malignant action of the disease, while it accelerates its progress and aggravates all its symptoms. The tumours of this kind, it will be easily understood, are those denominated medullary *sarcoma*, encephaloid tumour, and *fungus haematodes.*

Let us see how the views of Mr Travers may be applied to the explanation of the difficulties and the reconcilement of the discordances here mentioned.

According to this pathologist cancer is a genus, all the varieties of which belong to one or other of the two following classes of malignant disease: 1*st*, Disease of a part which, when it has reached a certain stage, generates a poison, and thus diffuses its species, and destroys contiguous textures, so that after this stage is reached, however complete its apparent extirpation or destruction may be, it is liable to reappear; and 2*d*, Disease of the constitution, showing itself primarily and exclusively in tumours, bearing a similar character, in various parts of the body, and proving, within a short period, destructive to life, notwithstanding the earliest interference of art.

It is almost unnecessary to observe that, in the former designation, Mr Travers refers to *scirrhus* or *carcinoma* proper, and in the latter to the tumour named medullary *sarcoma*, encephaloid tumour, and *fungus haematodes*.

In his subsequent observations he adopts the terms *Carcinoma* as a generic one, and distinguishes it into two species, scirrhous *Carcinoma*, or the hard or stone-cancer, and medullary *Carcinoma*, or the soft, or medullary, or bleeding cancer.

Scirrhus or scirrhous cancer he regards as at first a local or isolated disease, and confined chiefly, in the first instance, to secreting structures; for instance, 1*st*, the follicles of the mucous membranes, as those of the mouth, *fauces*, stomach, and intestinal canal; 2*d*, the glands of the reflected integument at the orifices of canals, as those of the vagina, womb, anus, and *urethra*; 3*d*, The follicles of the skin, especially where they are most abundant, as in the face, scrotum, and prepuce; 4*th*, the secreting or conglomerate glands, as the lachrymal, salivary, and mammary glands, the liver, pancreas and testicle; and 5*th*, the lymphatic, absorbent, or conglobate glands. When Mr Travers states that he is not aware that it *originates* in other textures, it must not be forgotten that this is not equivalent to denying that it exists in other textures; and it must be further allowed that he makes ample provision for the explanation of its occurrence in any one of the organs of the animal body. He accords with Dr Carswell in representing scirrhus to be an adventitious and not a converted or changed structure; but he regards the heterologous matter as deposited in the connecting parenchymatous tissue, while he thinks the glandular does not receive it, but only yields slowly to the deposition as it is infiltrated into the interstitial spaces. Proof is wanting, he thinks, that glandular structure is more than the *nidus* of the disease. The compactness of the texture of the gland is in general a counteracting cause of scirrhous deposit; and when the gland is encased in a dense, firm sheath, as in the case of the testicle, the scirrhous deposition is rare. In glands of looser structure, on the other hand, as in the female breast, it is much more common. To this rule, he conceives, even cancer of the *uterus* forms no exception; as the disease begins not in the body or cervix of that organ, but in the reflection of the *vagina* at its orifice where the loose membrane becomes strict, as he calls it, that is, we presume, tight and firm. This certainly accords with the result of the observations of Madame Boivin, not only as to the mode of commencement of the disease, but also as to the idea of its primary local character. That lady, it will be remembered, Edin. Med. and Surg. Journal, Vol. xl. represents cancer of the *uterus* invariably to commence as a local malady at the *os uteri*, and either in the vaginal membrane and follicles, or in the *glandulae Nabothi*, and to be of the nature of a chronic inflammation, which, if subdued by the seasonable and prompt employment of remedies, does not proceed to the stage of *scirrhus*, but which, if allowed to advance without opposition, very soon induces, in the textures at the *os uteri*, changes which are recognized to present the characters of tubercular scirrhus.

The origin of the true scirrhous tubercle or glandular structure is explained by Mr Travers in the following manner.

> "Glandular organs are the seat of *Scirrhus*, because they are more abundantly than other parts supplied with vessels, whose office is the separation and combination of new materials from the circulating fluid; and it is sufficiently probable, that when having been habitually and actively employed, they cease to be so, these vessels make preternatural deposits, and expend their energies, wantonly as it were, upon new and useless structures."

He does not deny, however, that cancerous disease often arises in individuals in whom the organs most readily affected have not been subjected to extreme variations in capacity. It is commonly said that cancer of the female breast is more frequent in virgins than in females who have been married and have suckled children. Is this fact well established? It appears, on the other hand, that there is often something like excess of action, or irritation long applied to the vascular system of an organ, previously to the developement of the carcinomatous deposition; and in other instances this is combined with the gloomy and depressing passions, and the moral influence of a long train of calamitous circumstances, which seem to produce a degree of congestion and imperfect circulation in several organs.

But is it the fact that cancer always originates in glandular structure? Does it never commence in muscles or in bones? It is manifest that Dr Carswell maintains the converse of this; and indeed the fourth plate of the third number contains delineations of the occurrence of the disease either in the periosteum, the bone, or in the medullary membrane.

We have already seen that Mr Travers maintains, that, in the majority of cases, scirrhous cancer, as he terms it, or simply cancer, is at first and in its commencement a disease local and isolated. After some time, however, he allows that it acquires a more general and comprehensive character. The local evil which takes possession of a single point or a particular region of the body, or it may be a single texture, may subsequently reproduce itself like a morbid poison, and in this manner contaminate the system at large. The best specimen he conceives of local cancer is that of the cutaneous cancer, as it is sometimes named, occurring on the face, nose or lips, which, if not irritated by injudicious management, often preserves the local isolated character for a long series of years. He also refers to the instance of the liver as presenting a good example of the insulated formation of the scirrhous tubercle, as the contrast in colour and texture display the definite outline of the diseased growth, and the gradual displacement of the glandular structure. Additional proofs of the local character of the disease he deduces from the following facts.

"A sudden and extensive gangrene has been known to eliminate the disease completely, and upon this principle the cautery, arsenic, and other corrosives, are sometimes successfully employed by cancer curers. Mr Cline had a patient in St Thomas's Hospital many years ago, in whom the sloughing process went on spontaneously under a linseed meal poultice, to such extent, that the wound afterwards healed soundly. I have seen more than one case in which extensive cicatrices of ulcers existed with much puckering and stretching of the skin of the chest, and no vestige of the breast remained. In one of these the patient, a lady residing in Berkshire, resisted the pressing advice of a consultation of London surgeons to allow of the extirpation of the tumour many years since. She has been in the constant habit of taking the medicine then prescribed, the extract of hemlock, almost *ad libitum*, with which she supplies herself regularly from Apothecaries' Hall. She is still a stout, healthy-looking person, as formerly, and attributes her cure to the medicine." P. 214.

Mr Travers adduces in like manner the frequency with which the disease presents an inert character, remaining so for a long lapse of time, without any evident influence on the constitution, or receiving influence from that, and refers to the case of a lady who, at seventy years of age, enjoyed uninterrupted good health, though the breast had been for years the seat of a tumour as large as a hen's egg, with the genuine scirrhous character. This patient had been in the habit of taking sarsaparilla as a beverage, and Mr Travers is of opinion that what in no degree affects her health, will not eventually shorten the duration of her life.

Mr Travers, on the other hand, makes two admissions which imply the affection of the constitution. The first is, that though scirrhus may in its commencement be a disease local and isolated, yet a particular stage of its progress denotes its malignant character; and it is only prior to this stage that removal confers security, while subsequent to this stage, removal is unavailing, and he believes may probably shorten life. When this particular stage commences, he does not attempt to determine; but we are led to understand that it is when the tumour betrays indications of activity, and the consequent power of affecting the constitution. "When ulceration begins, he observes, absorption begins; for ulceration is the action of the absorbents. Ulceration is distinguished by a peculiar pain, and it has been observed that, after this peculiar pain is complained of, the operation is seldom successful."

The other admission made by Mr Travers is, that scirrhous cancer also developes itself occasionally in remote organs after the removal, and without the return of the external tumour. Thus he allows, that a year or two after the extirpation of the breast, he has met with the scirrhous tubercle in the liver and in the *uterus*. These instances, though rare, are nevertheless sufficient to prove that the origin and developement of the disease depend in certain circumstances upon general causes, or those which operate through the medium of the constitution.

These circumstances lead Mr Travers to think that there are two classes of cases of cancer, and he evidently means scirrhous, or hard cancer, or simple *carcinoma*. In the first of these the constitution seems either to labour with the morbid or heterologous matter, before its local manifestation, or, by the general and simultaneous failure of the healthy functions, it appears to invite, or be incapable of resisting the approach of the malady. This variety is exemplified by those cases in which mental disquietude, bodily fatigue, or suffering, impaired digestive power, wasting and muscular flabbiness, with a sallow haggard aspect of the countenance, and prurient or erythematous affections of the skin, precede the accidental discovery of a small hard body in the breast. Of this kind he mentions an instance in a widow lady of 57, who had suffered severely from domestic affliction a year previously, and who consulted Mr Travers and Mr Cline, within six weeks from the first recognition of the tumour. The opinion even at this apparently early period was opposed to operation on the ground of the general circumstances, not the local, which were as favourable as could be conceived. The disease proceeded through all its stages, and terminated fatally within the space of two years. It must be observed, however, in regard to cases of this kind, that it is always matter of doubt whether the tumour did not exist a considerable time before its recognition by the patient, and whether the inert or latent state had not been formed before chirurgical advice is asked.

In the second class of cases, which Mr Travers believes to be more frequent, so little does the constitution sympathise with the local malady, that the actual enjoyment of health appears not to be incompatible with the slow progress of the scirrhous tumour for years, while the pain or uneasiness is so inconsiderable as scarcely to draw attention. Suddenly, however, it may become uneasy from increase of size and weight; a short acute darting pain with a flush of heat, is felt at lessening intervals; and though the health is not greatly deranged before the skin is inflamed, or threatens to proceed to ulceration, yet, notwithstanding the energy of the animal spirits and the mental fortitude of the individual, the penetrating and practised observer may discover, in the sallow, leaden-coloured complexion and lustreless eye, the languor and frequent headach, interrupted rest, and defective appetite, and especially in the lessened volume and firmness of the muscles, that the poison of the local disease is beginning to pass in every direction into the vascular system.

In the latter class of cases, Mr Travers evidently maintains that the disease or contamination is at first exclusively local; that the poison is generated in the part affected; and that the "atmosphere of contagion" as he expresses it, is for a period longer or shorter, restricted to the contiguous parts. Ultimately he allows that there is reason to believe that the poisonous matter is so disseminated as to alter the integral composition of all parts, solid and fluid, of the fabric.

In considering the mechanism by which this affection of the constitution is effected, Mr Travers is of opinion, that the veins and excretory ducts opened in the progress of ulceration, as well as the absorbents, become laden with the morbid secretion, and may then act as channels of the disease. He observes, however, that it is not the inflammation excited in surrounding parts by the irritation of a semiorganized tubercle, which is productive of the poison; since on this supposition, the scirrhous tumour could not remain stationary, as it sometimes does, for twenty years, without change of bulk or texture in the organ, and without detriment to the health of the individual. Nor does he allow communication with the surface to be necessary to the production and fatality of the poison, since it sometimes terminates life before reaching this stage. So long as the tubercle is entire, he thinks the poison either is not formed, or does not act upon the system, because observation shows that complete and final recoveries have been effected by free removal of the disease at the early period.

"On the contrary," he continues, "if the tubercle be softened, and undergoing ulceration, or absorption, the disease recurs, however freely the part be removed in the majority of cases; although perhaps, a few years extension of the term of life may be gained by the operation. The formation of the poison, therefore, is concomitant not with the adhesive but with the ulcerative inflammation; and it is fair, I think, to infer, that the matter of the poison is generated not by the action which forms the tubercle, but by the series of actions instituted to destroy and remove it. But it is probable that the vessels which deposited the tubercles are the parents of those which nourish it, and from which, in the ulcerative stage of inflammation, the morbid secretion is derived."

In short, Mr Travers, though he does not allow scirrhus to be malignant in its origin, admits in many cases constitutional predisposition; and when, in cases of this description, the disease ensues upon slight local injury, or upon a tumour or ulcer of indolent character and long standing, he conceives that the disease, tumour, or ulcer, may be considered to furnish a model or physical prototype for the malignant action, and in process of time an elaboratory of the poison itself.

To us it appears that there is still another hypothesis which may furnish the explanation of some of the discordant facts and doctrines taught on this point; and as it borders very closely on that held by Mr Travers, it is proper in this place to advert to it. It is the following. In the second class of cases allowed by Mr Travers to form the largest and most numerous of *scirrhus*, there is reason to believe, that the tumours believed to be *scirrhus* in the latent or inert state,—may be not specific but ordinary tumours, and that to give them the scirrhous character and action, they require the scirrhous diathesis to exist and be developed in the constitution of the individual. Every instance of scirrhous tumour may be regarded as consisting of the matter of a common tumour, and the specific matter of cancer grafted or inoculated on it as it were; and previous to this impregnation with scirrhous matter such tumours may be removed with safety, but subsequent to this without benefit. It is to be kept in mind, that, of the existence of the cancerous *diathesis*, we have no unequivocal proof, save in the external and local developement of cancerous structure in various organs; and as the cancerous *diathesis* is never mentioned unless in reference to some local proof of its existence, it results that in many cases of hard, stony, irregular tumours appearing in the female breast or similar organs, until such tumours evince the specific and proper characters of *scirrhus* or *carcinoma*, we cannot with justice denominate them cancerous, or infer the existence of the cancerous *diathesis*.

The medullary cancer or medullary *sarcoma*, Mr Travers, on the other hand, allows to be uniformly a disease of the constitution, and proceeding thence to produce local effects. The leading characters of the disease, as distinguished from *scirrhus*, are very well stated in the following passage.

> "Medullary cancer differs from scirrhous cancer; 1*st*, In its property of affecting any or all textures without exception, skin, bone, muscle, fascia, tendon, ligament, nerve, membrane and gland of each description, blood-vessel, and all the viscera and organs of sense.
>
> "2*d*, In travelling as much by the blood-vessels as the absorbents of the part, and therefore not affecting contiguous parts only, but remote districts of the body; structures altogether dissimilar, and often many at the same time.
>
> "3*d*, In external characters—which, however modified by structure, situation, and connection of parts, are the reverse of those of

scirrhus, the tumour having a degree of elastic softness which conveys a sensation of fluidity, a uniform roundness, and a volume far exceeding that of scirrhus, and in short, more resembling a deep collection of matter.

"*4th,* In internal characters—being uniformly lardaceous on section, or pulpy, or semifluid, and intimately blended with original textures, *i. e.* deposited in their interstices and proper cellular tissue. By its seat it is modified in consistence, being in bone of so much firmness as to be osteo-sarcomatous in appearance; also in colour, as in the eye and some other parts, hence the term 'melanodes;' and in the limbs where it reaches a formidable magnitude, being mixed up with the coagula of blood which has escaped from the veins destroyed by it, 'hematodes.' The extreme states of a fresh and a decomposed brain present its different degrees of consistence; and its colour upon section is either opaque white or black, or a mixture of the two, a mottled gray and brown, or cineritious.

"*5th,* It differs last, but not least, from the scirrhous species, in being the disease of early rather than advanced life, and from the first a truly malignant and therefore a constitutional disease." P. 216.

By far the most important and distinguishing feature of this disease, is its tendency to affect several textures, organs, and regions simultaneously and successively. Thus when it appears in an extremity, not only does it affect several tissues at the same time, as muscle, fascia, periosteum, bone, and the articular tissues generally, but in all probability it has already begun to attack the pleura or the peritoneum, the liver or the pancreas, the stomach, liver, and duodenum, or in females, the uterus and the lymphatic glands of the pelvis. Manifold are the cases in which it makes its first external appearance in the female breast, and either after or without its extirpation from this organ, it is found to attack the liver or the peritoneum, and thus proves fatal in a very short time. These circumstances form a broad and obvious character of distinction from the ordinary form of cancer; and ought never to be lost sight of in the consideration of any measures intended to remove either disease by operation. In scirrhus, such a measure may be beneficial if adopted seasonably and promptly; but in medullary cancer, there is no period at which operation can be beneficial. On this subject, the testimony of all good surgeons is quite uniform and concurrent, and ought to put a stop to the practice still occasionally pursued, of operating in cases in which it has been long ascertained, that the knife becomes only an additional cause of the precipitate and aggravated career of the disease to its fatal issue. In addition to the many testimonies already given on this point, the following by Mr Travers deserves especial attention.

"The medullary cancer is so universal that a patient from whose limb a tumour of this species is removed, and to all appearance with complete success, falls a victim to the poison (if not cut off by some other disease) developed gradually or obscurely in some visceral organ or organs within a comparatively short time. I have never known a person survive this disease after its removal by the knife, more than four years, and in very few instances so long; when, as often happens, it returns upon the part or neighbourhood, its progress to destruction is vastly more rapid. After removing a medullary cancerous tumour from the calf of the leg in a young man, I was compelled within three months to amputate high in the thigh. After removing such a tumour from the foot, including some of the toes and metatarsal bones, of a young woman, she was attacked by the disease in the groin, and died within six months. So, after extirpating the testis, the disease has presented itself very speedily in the groin.

"Two young gentlemen, for one of whom a small tumour was removed from the thigh, and for the other, amputation at the thigh performed for a tumour involving the knee joint, lived each from three to four years, without any re-appearance of the disease externally, and with very little interruption to health in the interval; both died of the disease in the chest."—P. 217.

But it is idle to confine our study of this part of the subject to these facts only. The whole of the second and third part of the paper of Mr Travers abounds with similar examples of the general tendency of the medullary cancer to affect many textures and organs simultaneously and successively, and the unavailing result of operations attempted for their removal.

In other respects, Mr Travers regards the medullary cancer as the offspring of a modification of cancer by scrofula; *i. e.* a disease rising out of the combination of scrofula and cancer in the habit. In proof of this, he adds, that he has seen the disease terminate life by the formation of scrofulous tubercles of the *pleura* and *peritoneum*, and of abscesses of the lumbar glands; and that he has repeatedly noticed the subject of it to be of the strumous temperament. To this mode of explanation the principal objection is, that it explains too much, and is not sufficiently precise. Of what morbid disorganization may it not be said, that it is the result of the strumous diathesis? But how does it happen that the strumous diathesis produces so many other affections in other classes of patients, and in this class alone the medullary carcinoma. It is a fact, for the general accuracy of which we can vouch by the evidence of twenty years hospital and private experience, that, in the same persons who are liable to strumous affections in early life, scirrhous tumours are not unfrequently developed at a more advanced period. This fact, however, we adduce, not in order to prove the influence of the strumous diathesis in the production of cancerous disorders, but to show, that there is scarcely any species of disorganization which may not be ascribed to the influence of the strumous diathesis, and that it is consequently difficult to establish any precise inferences as to its operation in the production of malignant or heterologous tumours.

In the elaborate and accurate description of the physical and chemical characters, the anatomical structure and physiological properties of *carcinoma,* given by Dr Carswell in his third number, we find nothing to throw greater light upon these obscure points.

Under the head of physical characters, he refers the forms in which the cancerous matter may be arranged to three varieties, the *Tuberiform*, the *Stratiform*, and the *Ramiform.*

The tuberiform, or tubercular, which is by far the most frequent, occurs chiefly in organs possessing uniform density, in the natural and accidental serous surfaces, and in the subcutaneous and submucous cellular tissue. It consists in the heterologous deposit being moulded into globular, pyriform, and fungiform masses, giving the tumour often a lobulated appearance.

In the stratiform arrangement, which is observed chiefly in the subserous cellular tissue, the heterologous matter is deposited in the form of thin circular patches, varying from the breadth of a pin head, to an inch or more in diameter, of a cream or milk-white colour. They may occur beneath the *pia mater* and *pulmonic pleura,* without any trace of carcinoma in the brain or lungs; but Dr Carswell never met with them unless when the disease existed in some other organ, as the breast, eye, liver, stomach, kidney, or womb.

The ramiform, or arborescent arrangement of carcinomatous matter, is observed chiefly in the interior of veins; and the organ, in the venous system of which it is most usually observed, is the kidney, the veins of which, including the emulgent vein, to its termination in the *vena cava,* are sometimes found thoroughly distended with this heterologous deposit, either in a fluid state, or of the consistence of brain, or as firm as the pancreas. A kidney thus occupied when divided appears as if it were formed of a multitude of encysted tumours, various in size, by reason of the cancerous matter being contained within, and bounded by, the walls of the cut extremities of the veins.

The ramiform arrangement has been also observed in *carcinoma* of the stomach, and in the *vena portae,* independent of any particular organ being affected by the disease.

Lastly, the ramiform or arborescent arrangement may depend on the deposition of cancerous matter in the lacteals and lymphatics.

In the quality of bulk, the most important circumstance is the property possessed by the second order, or the cephalomatous tumours of increasing their bulk rapidly and to an almost unlimited extent by reason of their vascular structure.

As to *colour,* by which carcinoma is distinguished from all the other heterologous growths, it is most frequently white with a shade of gray or blue; sometimes it inclines to yellow, brown, or red, in consequence of the proper colour of the affected organ, or the admixture of blood, bile, purulent, or other fluids in various proportions, or some other accidental circumstance.

On the important character of the consistence of *Carcinoma* we find several judicious observations. But, as they do not easily admit of abridgement, we must be satisfied by referring the pathological reader to their attentive perusal.

In giving what may be denominated the analytical anatomy of the carcinomatous growths, Dr Carswell shows intimate acquaintance with their structure. The following elements he represents to be found, in variable proportions, in all carcinomatous tumours; 1*st*, carcinomatous matter; 2*d*, cellular, fibrous, and serous tissues; and 3*dly*, blood-vessels. The first forms always the largest proportion, and, indeed, constitutes the great bulk of the tumour. The second is often small in quantity, and so fine and loose as to be often imperceptible. Fibrous tissue is not often met with as an element of cancer in the situations referred to, viz. the interior of large veins, the surfaces of serous membranes, the *areolae* of the cellular tissue, or on the surface of a sore. Serous tissue, on the contrary, is much more frequent, either forming a capsule to the tumour or cysts, various in size, containing gelatinous, albuminous, or other fluids.

In the molecular structure of organs, on the other hand, affected by carcinomatous matter, the quantity of cellular and fibrous tissue is often very considerable. In the early stage of cancer in the female breast, uterus or ovaries, or in the liver or walls of the stomach, a species of firm, pale, compact, cellular fibrous tissue is not unfrequently the only anatomical element cognizable. This Dr Carswell regards as a tissue *sui generis*, produced by the uniform distribution and molecular deposition of the carcinomatous matter, either in the cellular tissue of an organ, or in an accidental tissue of a similar kind, formed during the deposition of the carcinomatous matter. This change Andral, in his usual spirit of premature generalization, denominated *hypertrophy* of the cellular tissue,—a denomination which we formerly showed that Madame Boivin and M. Duges condemned, and of which we here find that Dr Carswell, with great justice, expresses his decided disapprobation, as warranted neither by analogy nor by the subsequent changes which it undergoes. As it gradually becomes less apparent, as the cancerous deposit advances, and ultimately disappears, or undergoes the carcinomatous transformation, it seems rather to be of the nature of chronic inflammatory condensation, by the gradual encroachment of the carcinomatous deposit.

As to the vascular system of carcinomatous tumours, the vessels seen in the first variety or scirrhoma, appear to be branches from those of the adjoining tissues, which have become enclosed within the substance of what the varieties of this species of cancer are composed; while those of *cephaloma* are formed apart from the vascular system of the surrounding tissues, as they are seen to originate in small red points, situate at the centre, or at the circumference of the carcinomatous mass, which at first have the appearance of slender streaks of blood, and afterwards acquire a cylindrical arrangement and a ramiform distribution.

The *physiological properties* of carcinomatous growths depend on their anatomical structure. Circulation and nutrition they evidently possess in some degree; as the former is in many respects liable to derangement, we recognize in all carcinomatous tumours circulation rather by its derangements and disorders, than its normal effects. Thus obstruction of some of the vessels, congestion, extravasation, and hemorrhage, are all more or less common in every form of carcinomatous tumour; and in some instances these derangements proceed to such an extent, as to suspend, impede, or entirely arrest all nutrition; and hence occasional mortification of various parts of the tumour. Of this accident, as of others, obliteration of veins is a cause not uncommon; and the excessive and rapid growth of a contiguous part of the tumour, is also an occasional agent.

Here, however, for the present, we must pause.

Of the merit of the engraved delineations of this work we have already partly spoken. They have the advantage of being both faithful and beautiful; and they cannot fail to form an instructive guide to the student of pathology; and we must add, that they will be most useful in recalling to the remembrance of the practitioner the essential characters of specimens of morbid changes, which may have long previously fallen under his observation.

We shall take an early opportunity of resuming the examination of the succeeding numbers.

Art. VII.—*The Northern Flora; or a Description of the Wild Plants belonging to the North and East of Scotland, with an Account of their places of Growth and Properties.* By Alexander Murray, M. D., Part I. Edinburgh, 1836. 8vo. Pp. 150.

To those who take pleasure in the cultivation of practical botany, and are alive to the interest of recognizing the productions of the vegetable kingdom in their native localities, descriptions of the local Floras, as they are termed, or of the plants of particular districts, are of great value as guides. Of the utility of such companions on a botanical excursion, it would be difficult to produce a more forcible example, perhaps, than the *Flora Edinensis* of Dr Greville as to the county of Edinburgh. Previous to the publication of that useful work, the collector and student of practical botany had nothing to furnish the requisite information as to the distribution and localities of plants, except the *Flora Scotica* of Lightfoot, and the very useful List of Plants published by that able botanist, Mr Robert Maughan, in the first volume of the Wernerian Transactions. The publication of the work of Dr Greville tended directly and effectually to facilitate the labour of the collector, to promote the cultivation of practical botany, and to diffuse among the Edinburgh students a taste for botanical pursuits.

To this cause, promoted, doubtless, by the zealous encouragement of the study of practical botany, held out by the present Professor in the University, we can trace a much more extensive and minute knowledge of that science among the students during the last ten or twelve years than formerly; and we doubt not that the spirit will continue to increase and diffuse itself. Let us not forget the assistance also of Mr Macnab, to whose communicative kindness and minute knowledge of Scottish botanical localities, we have often felt deeply indebted.

The service which Dr Greville has performed for the county of Edinburgh and the students of its University, Dr Murray has undertaken not only for the county of Aberdeen, but for those of Forfar, Angus, and Kincardine, in the south, and Elgin, Nairn, and Banff, in the north, and for the botanical students of these districts.

To those acquainted with the botanical treasures of Scotland, it is well known that several districts in these counties are exceedingly rich in interesting plants; and the Clova mountains, in Forfarshire, the banks of the river Isla in Angus, those of the North and South Esk, and the sea coast in the counties of Forfar, Kincardine and Aberdeen, and the valleys of the Grampian mountains, with the banks of the Dee and Don and their tributaries, in the latter county, are districts of great interest to the botanical collector, and will continue to afford, if sufficiently explored, a valuable harvest of vegetable productions. Though we are aware that many of these districts are, from time to time, visited by some of our ablest botanists, who are thus contributing to render their merits as botanical localities more generally and accurately known, no work adequate to the interest and importance of the subject has yet been published; and much useful information is thus confined to those by whom it has been first acquired. It is needless to remark, that it is not the mere collection of information which is useful. It is the mutual communication and the diffusion of that information through a large circle that is most beneficial. The utility of the former is confined to the individual. That of the latter is diffused to the community, and its benefits very often are reflected to individuals. In a work like the present, therefore, scattered information is collected and arranged under proper heads, and much that is liable to be lost is preserved, while the whole is applied to purposes of practical utility and instruction.

The work undertaken by Dr Murray, of which the first part is before us, is constructed very much after the model of the Edinburgh Flora of Dr Greville. In addition to the usual botanical characters of each plant, Dr Murray gives descriptions of general situations affected by each, and the actual individual localities in which they are found; and, he has, besides, added illustrative observations, sometimes on the economical or medical uses of plants, sometimes on points of interest in their history, and in the case of rare or interesting plants, various points of information calculated to instruct or amuse. In the present number the author has proceeded as far as the close of the Pentandrous plants.

In performing this duty, it is evident that Dr Murray has taken considerable pains; and, besides being personally acquainted with most of the localities, he has collected information from all sources, published and unpublished, to which he had access. Not only has he rendered justice to several of those zealous individuals who have from time to time cultivated the knowledge of the botanical riches of these counties, but, with most useful and laudable diligence, he has employed the scanty leisure intervals of a laborious profession in visiting all the important localities within his reach, or which were calculated to afford instructive results.

Upon the whole, this work promises, from the specimen now published, to be not only highly creditable to the diligence and knowledge of the author, but very useful to those who are desirous to become acquainted with the botanical productions of the north-east of Scotland; and as such we strongly recommend it to the attention of students.

ART. VIII.—*An Essay on the Laryngismus Stridulus, or Croup-like Inspiration of Infants; to which are appended illustrations of the general principles of the Pathology of Nerves, and of the Functions and Diseases of the par Vagum and its principal branches.* By HUGH LEY, M. D. Member of the Royal College of Physicians London, Physician to the Westminster General Lying-in Hospital, Physician-Accoucheur to the Middlesex Hospital, and Lecturer on Midwifery at St Bartholomew's Hospital. Illustrated with plates. 8vo. London 1836, pp. lx. and 480.

THE volume before us consists, as its title implies, of two distinct portions,—the one devoted to the investigation of a disease, regarding which our information has hitherto been very vague and unsatisfactory; the other, to an elucidation of the author's views of the pathology of the nerves, and the functions and diseases of the *par vagum* and its branches. To the former we now beg the reader's attention,—our limits not permitting us to notice the latter.

That portion of the work of which it is our intention to present a brief abstract, consists of a preface, an introduction, and six chapters devoted to the consideration of the history, causes, pathology, *diagnosis*, *prognosis*, and treatment of *Laryngismus stridulus.*

In the preface, Dr Ley gives a history of the work, and in the introduction a full view of the literature of the disease, displaying a minute and extensive acquaintance with medical writings, both ancient and modern, rarely to be met with. He identifies the disease under consideration with the asthma of Hippocrates, Galen, Aretæus, Paul of Ægina, Celsus, Cœlius Aurelianus, Primerose, and Etmuller, the *asthma suffocativum* of Hoffmann, the *angina inflammatoria* of Russell, the spasmodic asthma of Simpson, the suffocating catarrh of Lieutaud and Chalmers, the asthma of Millar, &c. and refutes those writers who have denied the existence of the disease. For his remarks on the various writers, we must refer to the work itself.

I. HISTORY.—*Laryngismus stridulus* is thus described by Dr Ley. " There are few amongst the diseases of infant children more calculated to arouse the attention and alarm the fears of the friends and the professional attendant, than that well known sonorous inspiration, the frequency of which has led to the familiar appellation, by which such cases are readily recognized and briefly described of crowing children. This distressing malady, always formidable in appearance, and occasionally justifying alarm, because fatal in reality, consists essentially of a constriction of the *glottis*, which even in its milder form impedes the passage of air into the chest, and, in more severe instances, so completely closes it as to suspend altogether for a time the respiratory function. The child has an interruption, more or less perfect of its breathing; and after vehement struggles, often called, and even sometimes actually convulsive, it at length succeeds in drawing in its breath with a shrill sound, some say, like the crowing of a cock; at all events closely resembling the peculiar inspiration of croup and hooping cough, and arising from the same cause, a temporary diminution of the area of the *rima glottidis*. These attacks are paroxysmal, and vary in their frequency, severity and duration. At first, in general, the intervals are considerable; hours, days, or even weeks may elapse before the attacks recur; but, in the progress of the complaint, they return with such alarming frequency, that the child is scarcely free from one attack before another begins. The difference also in severity is striking. In its earlier stages, the attack is often very slight, yielding at the end of a few seconds, without the application of any remedial measures, and terminating in a fit of screaming or crying, succeeded by tranquil and refreshing sleep. In this state, the professional attendant, who has been suddenly summoned to the case, commonly finds his patient; but upon other occasions, and as the disease advances, so alarming is its degree of violence, and so unyielding its character, that I have known a nurse who doated upon the child which had long been the object of her care and solicitude, hurry the parents from the room, that they might not witness the extent of shaking, rubbing, and slapping apparently bordering upon cruelty, to which she has instinctively had recourse to restore the child from its state of impending suffocation. But the attacks also vary in the duration of the paroxysm. Early in the disease, so brief is its continuance, that, before the medical attendant can reach the house, and even sometimes before the friends can be summoned from another room, it has subsided. But in its course the attack becomes so lengthened, and 'redoubled,' as to continue from a quarter to half an hour, and, upon one occasion within my own knowledge, whilst a messenger traversed a distance of above a mile in quest of the medical attendant of the family. These variations do not depend altogether upon the length of time to which the child has been subject to the attacks, which may decline or cease for a time, and return with even aggravated violence." * * * "It may not always be easy to account for these irregularities, but I have found in general that where the severity of the disease does not progressively increase with its continuance, but has occasional remissions and exacerbations, the latter may commonly be traced to 'painful dentition,' the symptoms recurring as each successive tooth advances, and gradually declining or disappearing after it has penetrated the gum. In the earlier periods of this complaint, the attacks commonly take place in the night, or after a tranquil sleep. This is a marked feature of the disease, and has been noticed by all the principal writers upon the subject." * * "But when the disease is more firmly established, and has been of considerable duration, or even occasionally from the very commencement, 'they usually occur many times in the course of the day,' are brought on by causes to appearance very trivial, and 'sometimes they come on from no apparent cause.'" Pp. 1, 2, 3.

Dr Ley next criticises the various names given to the disease, and adopts, as least liable to objection, *Laryngismus stridulus*, given to it by Dr Mason Good. "It points out at once the seat of the affection, and the characteristic symptoms. *Laryngismus* marks the organ affected, implies difficulty in the performance of its function to the exclusion of the idea of inflammation, and involves no speculative opinions as to the nature of the disease, which it leaves open to inquiry; the adjunct *stridulus* at once announces the leading symptom which characterizes the disease."

From observation and reasoning which it would far exceed our limits to notice, Dr Ley concludes that at least a large majority of instances of the crowing inspiration of infants are produced by the enlargement of glands, situated in the course, and influencing the functions of the recurrent nerves, and even sometimes probably the *par vagum.* In opposition to those who would be inclined to refer the disturbance of the breathing in such cases to mechanical obstruction by direct pressure of the air tube itself, producing a diminution of its area, he alleges, *first*, "that there is no evidence of such a diminution of the calibre of the trachea; *secondly*, that infinitely large tumours, as the goitre, situated directly over the trachea, produced no such effects; *thirdly*, that this canal will bear a degree of pressure from a hard and circumscribed tumour, which may produce ulceration of the mucous membrane and ecchymosis without the occurrence of similar symptoms; *fourthly*, that the symptoms of this disease are not those of structural change, producing mechanical obstruction of the trachea, as must be clear to all who are familiar with the phenomena arising from inflammatory deposits in that tube; and *lastly*, that the seat of the disordered function does not correspond with the seat of the actual disease, which are, in fact, out of the reach of each other." These considerations lead him to the inference, "that it can only be by nervous communication between the disease and the muscles of the glottis, that the contraction of that chink, upon which the breathlessness and crowing inspiration depend, can be produced."

II. CAUSES.—These, in conformity with the usual practice of systematic writers, Dr Ley divides into predisposing and exciting, to which he adds those which produce the paroxysm.

A. *Predisposing Causes.*—The assigned predisposing causes of this disease are age, constitution, climate and season, diet and scrofula. "That age," says the author, "constitutes a very important consideration in calculating the chances of the occurrence of this disease, has been established by the accumulated observations of a continuous line of practitioners for above two thousand years." This he attributes to the relative size of the *glottis* and the greater frequency of the exciting causes. To these, some have added the nervous constitution and excessive sensitiveness of infantile life. He conceives, however, that this will be found to amount to little more than the bare assertion, that, from causes which produce no such effects on the adult, convulsions are not uncommon in infantile life. Before admitting this to the full extent, it would be necessary to prove that this affection is in reality a peculiar kind of convulsion.

Dr Ley conceives that a constitutional predisposition to *Laryngismus stridulus* may occasionally be traced in whole families;

that in dry elevated situations it is little known; and that a tendency to it is engendered by moist seasons and situations, and aggravated by sudden vicissitudes of temperature, and indiscretions in diet. He doubts, however, whether the tendency arising from the causes now mentioned "does not generally resolve itself into a mere disposition to scrofula." This view derives material support from the fact, that these are precisely the causes which call into action the strumous diathesis, and Dr Ley's own experience leads him to adopt it.

B. *Exciting Causes.*—The exciting causes enumerated are, dentition, inflamed scalp, head affection, bronchitis, disease of the lungs, and inflammation of the *pericardium.* Primerose, Etmuller, Hoffman, Burns, and Hamilton describe the affection as occurring during dentition. Mr North states that in many cases it is immediately connected with painful dentition. Dr Ley admits the frequency of the connection, but contends, that, as the crowing does not take place in every case of painful dentition, some intermediate change, which teething produces in some patients and not in others, is requisite to produce it. After stating that the observation of Cruickshank, that the glands of the neck frequently swell in children, from inflammation of the gums and alveolar process during teething, and recover when that process is over, might have led to the suspicion that this swelling was the intermediate link, he thus proceeds; "Scarcely an instance has occurred to me since my attention has been very strongly directed to the subject, in which there has not been the strongest foundation for the belief, that either the *glandulæ concatenatæ* of the neck, or the thoracic absorbent glands, have become morbidly enlarged. In these cases dentition is analogous in its influence to that of any other cause of local irritation, common or specific, upon glands situated in the course of those lymphatics, which lead from the part excited or inflamed to the venous circulation in which they terminate. * * * * The inflammation of the gums or alveolar processes, or enveloping membrane of the teeth, may produce morbid excitement of those glands in the neck, through which the lymphatic vessels from the teeth and gums are passing to their ultimate destination, and cause their enlargement even in the absence of all strumous taint; but still more certainly if such taint exist." In the same way he believes inflamed scalp to produce the same effect.

Some connection between this affection and cerebral disturbance has been either hinted at or asserted by many writers. That these occasionally coexist, Dr Ley, from his own experience affirms, but does not believe that the disease in question is produced by the direct operation of cerebral pressure, excitement, inflammation, or effusion. The relation between the two, he states, may be, that either of cause, coincidence or consequence. When the symptoms of head affection precede those of laryngeal obstruction, he thinks it not improbable that the morbid condition within the *cranium* may be the indirect cause of that imperfect opening of the *glottis* which occasions the crowing. "The head affection may be prior, and produce, by remote and indirect consequence, the laryngeal complaints; they may occur together as mere coincidences, without any other association than the existence of a constitutional malady, which may be the common cause of both; the cerebral disturbance, again, may be the consequence of the frequent attacks of breathlessness, almost amounting to *asphyxia,* which, by impeding the flow of blood through the lungs, causes accumulation within the cavities of the heart, and subsequently venous congestion within the cranium; and this may be followed by effusion of *serum* into the ventricles or between the membranes of the brain, and occasionally and remotely by inflammation and its ordinary consequences."

Bronchitis.—Disease of the lungs and inflammation of the *pericardium* are admitted by Dr Ley to produce the affection indirectly; the first two by irritating and occasioning a tumid state of the bronchial glands; the latter by causing the same morbid state of the glands which receive the absorbents of the heart, and which are situated not upon the heart, but behind the middle of the arch of the *aorta* and at the root of the trachea. In such cases, however, the individuals affected are prone to glandular disease.

C. *Causes of the paroxysm.*—These are strainings of the body, exercise, fretting, cough, abdominal distension, sudden awakening from sleep, fright, effort to swallow, and sudden applications of cold. Into an examination of the mode in which each of these acts, Dr Ley enters at considerable length. For his reasonings and speculations we must refer to the work.

Dr Ley thus sums up the views contained in this portion of his treatise.

"It results from this examination that the predisposing causes are such as have a tendency to produce, and do actually produce, glandular enlargement, or to call into action a scrofulous tendency; that the exciting causes are such as are peculiarly apt to occasion enlargement of the cervical or thoracic absorbent glands; and that the causes of the paroxysm are such as by natural association without morbid influence, involuntarily close the *glottis*; that the breathlessness which commonly precedes the sonorous inspiration, cannot therefore be from this closing of the *rima glottidis,* which in such cases is perfectly normal, but must arise from defective power in those agents whose office it is to open that chink; and lastly, that the crowing inspiration, which is nature's imperfect cure of the temporary suspension of breathing, arises from the chink being only partially open for the admission of air, and remaining so, until some explosive expiration, such as screaming, crying, coughing or belching, shall mechanically burst open the flood gates, and perfect the recovery from the paroxysm."—P. 103.

III. Pathology of the Disease.—Under this head, Dr Ley enters into an examination of the opinions of the different writers who have discussed the subject. Omitting his remarks on those of others, we shall endeavour to present a view of his own. In the early part of his professional life, he believed the complaint to be spasmodic, but, being unable to trace any intimate alliance with cerebral affection, had a vague notion that it was the result of nervous sympathy, nearly allied to that designated by John Hunter, contiguous sympathy. This explanation, however, appeared to him by no means satisfactory, from its being deficient in many particulars, and he was led to make more minute and accurate inquiries into the kind of constitution most liable to the disease, and the causes which directly produce it. Finding that it originated in causes differing in situation and essence, he was driven " to seek for some intermediate link in the chain of events common to them all, and of general if not universal occurrence in combination with the laryngeal affection to which the symptom might be referred." The result of the inquiry convinced him that, be the remote cause what it may, the common link in the great majority of instances, is enlargement of the thoracic or cervical absorbent glands. " All the principal causes of the disease," he observes, " as contradistinguished from the cause of the paroxysms, are capable of producing such enlargement, and experience confirms what a very general pathological connection might have suggested; for I have found the relation between such enlargement and the crowing, when it has occurred, all but universal, and proved by observation during the life of the patient, or the examination of the body in fatal cases; and even in the very few instances in which it may have been difficult to detect the glandular affection, in consequence of the change of form in these glands from the compression of superjacent textures, or from their being within the thorax, the occurrence of similar symptoms might justify more than suspicion of its existence." That the connection between morbid enlargement of the bronchial or cervical absorbent glands and the crowing inspiration of infants, should have been so long overlooked by pathologists, he thinks may be explained by the fact, that the disease is not very commonly fatal, and that the mode in which *post mortem* examinations are conducted is by no means calculated to insure the detection of the diseased structure.

Dr Ley next proceeds to point out the mode in which enlarged glands in the neck and thorax produce the affection of the *glottis*. The two clusters or chains of glands thus subject to induration and enlargement are placed in the immediate vicinity of organs of vital importance in the animal economy, and when morbidly increased or hardened, must exercise a pernicious influence on these parts. " In children, indeed, absorbent glands are perhaps rarely sufficiently large or hard to encroach upon the area of the trachea, or to interfere in any considerable degree with the circulation of the blood in either arteries or veins; but they occasionally obstruct lymphatics in their course, and may impair materially the function of neighbouring nerves. * * * * The constant movement, the alternate dilatation and contraction of the bronchi, together with their elasticity, afford this part of the tube essential protection." But granting that pressure causes an approximation of its sides, "it must be manifest, that the obstruction being permanent, the distress would be continuous; whereas in this disease, as is well known, the attacks are paroxysmal, occurring at different, often distant, intervals, and the symptoms present themselves at a part far distant from the glands themselves. The trachea, again, is preserved from injurious compression, by its position, its shape, its elasticity, and its movements. * * * * The *glottis* itself is amply protected from mechanical pressure," in consequence of its position, which, "moreover, excludes the possibility of the muscles, which alternately enlarge and contract the *rima glottidis*, being impeded in their action by these glands, in the way of direct apposition and compression. * * Neither can these glands interfere with respiration by any influence which they are capable of exerting upon the great vessels of the neck," because it is now "abundantly ascertained, by experiment and observation, that even complete obliteration of these vessels produces no such symptoms, as have been ascribed to minor impediment from pressure. That glands in their enlarged and indurated state may produce some obstruction of the lymphatics in their course is well known, and the puffy condition of the face, and especially under the eyes, occasionally observed in this complaint, may possibly be owing to this cause. But the combination is purely accidental, has no influence upon the character of the complaint, and is not the cause, because it affords no explanation of the phenomena of the disease. Since, therefore, these glands do not mechanically obstruct the air tubes, or even touch the muscles affected, since they do not compress the great vessels, or in any important degree the lymphatics of the neck, no other mode of explanation remains to us than that of some influence which they must exercise upon the respiratory nerves."

After quoting a case from Sir Charles Bell, in which, "from the action of mercury on the mouth, a lymphatic gland between the mastoid process and the angle of the jaw, compressed a branch of the seventh pair of nerves; and the muscles of the face on that side were so completely paralyzed, that the cheek was drawn by their antagonists, and the mouth disfigured," Dr Ley proceeds to show, from the anatomical relations of the parts, that enlargement of the glands referred to will affect the pneumogastric and its recurrent branch, while the superior laryngeal will be unaffected. Now it has been proved that the latter supplies the muscles which close, and that the former terminates in those which open the larynx. Pathology teaches us, that pressure upon a nerve or a solution of its continuity diminishes or destroys its energy in proportion to the extent to which these injuries are carried. From these and many other facts, for which we cannot make room, and the inferences which may be legitimately drawn from them, Dr Ley conceives himself entitled to conclude, that *Laryngismus stridulus* consists especially in a diminution of the energy communicated by the *par vagum* to the opening muscles of the *glottis*, and that this diminution is owing to enlargement of those glands situate near the main trunk or its branches. In the following passage Dr Ley answers the objections which may be made to his opinion.

"*1st*, It has been doubted whether glands enlarged by simple irritation or even scrofulous disease are capable of paralyzing nerves in their course. *2dly*, Some have thought, and it is still a prevailing impression, that a moderate degree of pressure is more likely to excite than to paralyze a nerve. *3dly*, It has been alleged that these glands are often enlarged without producing the complaint. *4thly*, It has been asserted that this crowing has been often observed where no enlargement could be traced. *5thly*, It has been argued, that, if these glands acted upon the principle of compression, the pressure being permanent, the symptoms should be so too; and lastly, it has been stated, that this disease requires bleeding and calomel for its cure, which would not be the case if the disease depended upon enlargement, especially scrofulous enlargement of the glands; and each of these objections deserves and requires a brief consideration."

The first two objections are fully answered by a reference to the numerous facts which prove both that enlarged glands are perfectly capable of compressing nerves, and that diminished energy to a greater or less extent, or even complete paralysis, is the effect of such compression, and never an increase of power.

"The allegation, that the cervical absorbent glands are frequently enlarged where there has been no crowing is unquestionably true, but admits readily of explanation." * * "Mere contiguity is notoriously insufficient to occasion paralysis. There must be direct compression of the nerve to produce the effect, and probably, superincumbent pressure as contra-distinguished from extension or stretching from the nerve passing over the surface of a tumour." * * "Enlargement of an axillary gland will sometimes paralyze one or more of the nerves of the axillary plexus, or even the whole arm may be benumbed from it; but upon other occasions the nerves will escape, and it has been the same *mutatis mutandis*, with the lumbar, the inguinal, and the popliteal glands. Dislocations of the humerus and femur will also sometimes compress contiguous nerves, occasioning paralysis; whilst upon other occasions the nerves are beyond the reach of pressure. Enlargement, from pregnancy or other causes of the uterus, and ovarian or other tumours within the pelvis, will occasionally paralyze by pressure nerves proceeding from the lower part of the spinal marrow, but upon other occasions no such affection occurs. It thus appears that tumours, or other causes of compression, placed directly over the course of a nerve, may paralyze the parts supplied by that nerve; and yet, upon other occasions of the existence of a similar disease, the nerves may be placed just beyond the reach of the injurious influence, and consequently retain their powers and attributes. It may, therefore, very well happen that a cervical or thoracic absorbent gland, an aneurism of the aorta, or of the right subclavian artery, may compress and paralyze the recurrent nerve, and occasion attacks of breathlessness, often amounting to complete asphyxia, yet, upon other occasions of similar disease, the gland being one twentieth of an inch further to one side, the nerve one twentieth of an inch to the other, no paralysis occurs. Pressure is no longer exerted upon that slender line not exceeding the tenth of an inch, occupied by the recurrent, and the nerve consequently escapes. It has, however, been further alleged that the crowing inspiration may occur without enlargement of glands. I have already conceded the possibility of this, although it is a very rare occurrence; for in each of about thirty cases which have occurred to me in succession, I have detected them in the progress of disease. The inability of other practitioners to detect them, may be either from the natural difficulty of tracing them which sometimes presents itself, or from insufficient examination. If the thoracic absorbent glands are exclusively affected, we may suspect and believe it from the symptoms, as in the first case I have recorded; yet we have no means of ascertaining the fact definitely but by examination after death. There are no stethoscopic indications of such disease; and auscultation, therefore, mediate or immediate, will teach us nothing. Illustrations also of the difficulty of detecting the nature and extent, nay even the existence, of tumours under the fasciæ and other textures of the neck, must be familiar to all who are conversant with the relations of these parts, or with the anatomical and surgical writings of our own time with reference to this subject. 'Those,' says my late friend and colleague Mr Shaw, 'who have once dissected a tumour from under this muscle (the platysma myoides,) will never forget the strength of these fibres in the living body, though they appear so trifling in the dead subject. We can now understand why tumours of the neck, when they are enlarged. are pushed inwards; and that they may be larger than a superficial examination would lead us to suppose.' Mr Allan Burns, too, tells us that 'tumours beneath the fascia are more frequent in their occurrence than those exterior to it, and are much more dangerous in their nature. Such tumours are firmly bound down by the fascia, they are flattened on their surface, are consequently large before they protrude externally, and are intimately connected with the deep-seated parts. They produce greater effect on breathing and swallowing than would be expected from their apparently small size. Indeed, the extent of their adhesions can hardly be discovered, because, although they be small and regular on their outer surface, they often stretch back amongst the muscles and vessels, and *adhere to the large nerves.*' These are the general observations of accurate anatomists and experienced surgeons, and are decisive upon the point to which they address themselves." * * * "But these glands may also escape observation, in consequence of hasty and imperfect examination. In the course of a few weeks, no less than three interesting illustrations of this presented themselves to my notice." * * * "Those cases, with the considerations naturally connected with them, lead me to receive with hesitation the statements which have been made with great confidence, of the non-existence of any morbid enlargement of the absorbent glands in cases of crowing; and the argument, therefore, thus founded upon the want of an invariable association of the two, is far from convincing. They may exist within the thorax, when they can only be ascertained by dissection. They may be difficult of detection from the compression of thickened fasciæ and superjacent muscles; or they may escape notice from imperfect examination." * * * "Some whose opinions I respect, see in this paroxysmal character of the disease an argument against its dependence upon enlargement of glands, which being a permanent cause, should, according to them, produce a permanent effect. This, however, applies at least with equal force to the other assigned causes, and especially to vascular turgescence or excitement within the cranium. But, although it may be true that the enlarged glands constitute a permanent disease, it by no means follows that pressure is constantly excited,—at least to an extent which is sufficient to paralyze the nerve. In some positions, and probably in a relaxed state of the muscles of the neck, there may be no morbid influence exerted. A gland, which, when the neck is straight and quiescent, is not directly over the nerve, may be brought in contact with its surface upon a sudden change of posture; and the muscles, then in vigorous action, may at the same time so bind down or push inwards the tumour, as to produce a morbid effect; hence in some instances we hear of the fit being produced by a sudden twisting of the neck. Or the gland, although constantly over the nerve, may require additional compression to produce the effect. Hence, a fit of crying, or of coughing, or even of hiccough from flatulency, will not unfrequently prove the occasional cause of a fit, because in these states the muscles of the throat are notoriously in violent action. Again, the causes may vary in kind and intensity, and the size, permanence, and hardness of the tumour will vary accordingly. A bubo, from simple irritation, as from chafing, will rapidly subside upon soothing the local cause; and so in this disease, within a few hours from irritation of the gums or membrane covering a tooth, the glands swell, and the paroxysms occur in rapid succession; but, upon lancing the gums freely, the excitement is subdued, the glands diminish, and the fits often first become less frequent and shorter in duration, and then entirely disappear. But the pressure, and even the paralysis may be continuous, and yet the manifestations of this state be occasional only. This, it is now well known, is often the case in paralysis arising from local pressure upon the respiratory nerve of the face, as has been satisfactorily shown in the papers of the late Mr Shaw upon this subject, and in the observations of Sir Charles Bell. In these cases, the defective power is often not observed until speaking, mental emotion, or difficulty of breathing call these muscles into rigorous action; then one set of muscles acting to the exclusion of their antagonists, the face is distorted. It is probably the same with the glottis. Although physiologists speak in general terms of the opening and shutting of this important chink in ordinary respiration, it must be obvious that in neither of the alternate actions of the respiratory functions can it be completely closed. In inspiration it must admit the entrance inwards, in expiration it must equally allow the escape outwards of the air; in both, therefore, it must be pervious; and as to the slight period which intervenes between the two, the labours of the physiologist have taught us nothing upon a point, which, after all, is scarcely worthy of inquiry. We know, however, that the medium state of this elastic chink, when uninfluenced by muscular agency, is that of permeability to the ingress and egress of air." * * * "We are unconscious of any movement of this part in ordinary respiration; we know that it is always open, unless closed for some special purpose, as to prevent the intrusion of an extraneous substance into the windpipe; it even opens, after it has been closed, in that short expiratory action, which, in the ordinary state of things, immediately succeeds the effort to swallow, and which requires a positive and almost painful exertion to interrupt. It is, upon the whole, therefore, more than probable, that, in ordinary and easy respiration, the muscles of the glottis are little, if at all, exerted. But when the breathing is embarrassed from any cause, an obvious and even considerable opening of the glottis may be seen. And, as paralysis of the muscles supplied by the respiratory nerves of the face and neck in some cases only manifest itself when the muscles of one side, in a healthy condition, act unopposed by their antagonists, so in the glottis, the effects of the enfeebled and even paralyzed state of its opening muscles is only observed in those more vigorous efforts which are made when respiration is hurried or impeded,—as in fright, in sudden waking from sleep in consequence of some strong external impression, in screaming or crying, in coughing, or when the descent of the diaphragm is prevented by distension of the alimentary canal, whether from the accumulation of indigested or feculent matters, or simply from flatulence, the result of indigestion. All violent exertions of the body will, by the closure of the glottis, which such exertions imply, occasion a paroxysm." * * * "In all these cases of vigorous and forcible muscular exertion, the closing muscles of the glottis, acting without antagonists, cause such an approximation of the sides of the glottis as, existing in one degree, may occasion a slight wheezing; in a second, and greater may produce the crowing inspiration from the rush of air through the constricted aperture; and in a third, and still greater degree, may hermetically seal the larynx against the admission of air, occasioning asphyxia. This latter state is generally only temporary, and is commonly followed by sonorous inspiration, which is nature's remedy, rather than the essential disease; and this natural cure is brought about either by the gradual cessation of action of the closing muscles, in conformity with that universal law of muscular motion, that after contraction the fibres will relax of themselves, or from some temporary cause of pressure, which had influenced the nerves, by forcing the glands inwards, being diminished or removed. Their nervous energy being restored to the recurrent, the parts which it supplies recover their tone and power of action, and again open the chink, for the purpose of respiration. More, perhaps, is to be ascribed to the restoration of the power of contraction in the opening, than to the cessation of action in the closing muscles, as it is found that, if the inability to inspire continues uninterruptedly for the space of about two minutes, the child then falls a victim to the disease." * * "I may notice one other cause, which, being occasional only in its influence, will tend materially to explain why this complaint should thus occur in paroxysms, and why the attacks should occur so frequently in the night. I have already adverted to the agency of the fibrous bands at the back of the trachea, in getting rid of the secretions of that tube, and have shown that these fibres as well as the lining membrane are supplied with nervous energy by the filaments of the recurrent. This function is aided by the subsidiary agency of the muscles of deglutition and of that peculiar action of the cricoid cartilage, by which its anterior edge at the moment at which the glottis is closed, is carried upwards, and under the lower border of the thyroid cartilage, by the contraction of the crico-thyroid muscle, which is supplied by a particular filament of a nerve from the upper laryngeal, for the purpose of such associated action. During sleep the enfeebled fibrous bands, with impaired sensibility of the lining membrane of the trachea, are deprived of this auxiliary power. Accumulation is the consequence, which, it is well known to all who have accurately observed this disease, is a common precursor of an attack. Even mothers are aware of this, and anticipate a paroxysm when they perceive 'that kind of noise which an increased secretion of mucus in the air passages would produce.' The mucus thus accumulated ascends and descends in the trachea, as may be ascertained by the sound, and, as it is well known, occurs with any extraneous substance in the trachea; the child, however, in consequence of the diminished sensibility of the tracheal membrane, suffers little." * * "And, as a foreign body in the trachea pumping up and down that tube, in the alternate actions of inspiration and expiration, at length reaches the sensible glottis, whose nervous energy is unimpaired, and produces strangling cough, so this mucus reaching from time to time the cricoid cartilage, is thrown by the elevation of its anterior edge, into the rima glottidis, the action of the muscles of which cause this chink to close upon that which operates as an extraneous and irritating substance; and, as the chink cannot open for the dislodgement of this substance, 'a fit of asphyxia from impossible action of the opening muscles of the glottis' is the result. Hence it is that the child, after the mucous rattle has been for some little time observable, gets an attack; and hence it happens, as in the third case which I have detailed, that the attack not unfrequently occurs at stated intervals, at the expiration of which the average accumulation is such, that, notwithstanding the enlarged calibre of the trachea from paralysis of the fibrous bands at its posterior part, the mucus will reach and irritate the glottis. It has fallen to my lot to be asked upon several occasions, and in a tone of triumph, as if the question afforded an unanswerable argument against the views which I have suggested of the pathological character of this disease,—how it happens that this disease is curable by blood-letting and calomel? I believe that where head affection coexists either as a cause, concomitant or consequent, much benefit has been derived from these remedies, and perhaps much serious mischief from their omission. If the vascular disease within the head has been the cause of enlargement of the glands, the irritation being removed, the glands will subside or disappear, and the pressure be consequently removed. But even where there is no suspicion of head affection, temporary relief, although at a lamentable expense of constitutional power, is occasionally produced by the loss of blood. It may, for instance, allay the irritation of painful dentition, though the means are so disproportionate to the end, that their employment would be 'like breaking a fly upon the wheel.' It may, by diminishing the activity of the circulation in the glands, diminish their volume, just as they decrease in size upon the death of an individual; it will enfeeble the compressing muscles of the neck, whose contraction has at least aided in the production of the paroxysms; and lastly, by thus diminishing muscular activity, it will also tend to relax the fasciæ, which add to the compression. But in these cases, the relief is not permanent, the symptoms are diminished for a while, but often return with aggravated violence, especially when the glands have any connection with a scrofulous taint." * * * "It is easy to understand how injurious, in many instances, these active remedies must prove, by aggravating that state of constitution in which such glandular disease is apt to occur, and, at all events, undermining the powers of the system, and exciting to morbid action the mucous lining of the bowels, which is amongst the causes of most frequent operation, in producing or aggravating disease of the mesenteric glands. As remedies, then, for crowing, these means are unnecessary or injurious, howsoever they sometimes prove useful in combating a concomitant state of cerebral excitement, and howsoever much they may occasionally, and for a short time, palliate the symptoms. But these remedies do not cure the crowing." * * * "It may, perhaps, be further suggested, as an objection to the explanation which I have offered of the constriction of the glottis in this disease, that, if enlarged glands can produce such results, adults should be equally subject to the complaint. But, in the *first* place, these deep-seated glands are not very liable to enlargement in grown persons; 2*dly*, The recurrent nerve is in them more efficiently protected, the larger diameter of the trachea causing the sides of that canal to project more considerably over the mere line which separates this tube from the œsophagus, and which is the precise position which this nerve occupies; and 3*dly*, the glottis enlarges considerably at the age of puberty, and is not then so easily closed in consequence of want of power of the opening muscles."—Pp. 135-155.

We have been induced to give these rather lengthened extracts, because they explain fully the author's views, and show that the doctrine which it is the object of the work to establish, and to the merit of the discovery of which Dr Ley is entitled, is the only one which can satisfactorily explain the various phenomena of the disease. We doubt not that the disease described by Dr Marsh in the fifth volume of the Dublin Transactions, and by Mr Fletcher of Gloucester as spasm of the *glottis*, owes its origin to the same cause as *Laryngismus stridulus.* Our limits will not permit us to state the grounds upon which we have formed this opinion, but we think that a perusal of Dr Fletcher's paper after Dr Ley's work will satisfy the reader of its correctness.

IV. TREATMENT.—Passing over the thirty-six pages devoted to the consideration of the *diagnosis* and *prognosis* of the disease, we come to the treatment.

We must endeavour, *first*, to ascertain whether the thoracic or cervical glands be enlarged, and trace, if possible, the cause; *secondly*, to distinguish, and prevent or counteract the operation of the causes of the paroxysms; and *thirdly*, to shorten the duration of the paroxysm. The constitutional tendency must be counteracted by those means which have a tendency to improve the general health and invigorate the frame. The patients ought to be kept in a dry and healthy situation. The inhabitants of large cities and manufacturing towns,—localities where the morbid condition on which the disease depends, is most apt to be developed,—ought to send the patient to the country, or, if this be beyond their means, or inconsistent with their arrangements, "the room in which the child spends the greater part of its time should be equally removed from the dampness of the basement story, * * and the sudden vicissitudes of temperature which a child must encounter immediately under the roof." "Warm clothing is all important." Under this head Dr Ley justly denounces the absurd fashion in which children are attired in the present day, and which is the source of so much disease, entailing after suffering on the victims of this silly caprice of ignorance and vanity. During fogs and rain, and when the wind is excessively keen, the patient ought to be confined to the house, and exercised in large airy apartments. In dry and temperate weather, exercise in the open air will be found beneficial. "Nor need we be deterred in these cases by the mucous rale, so frequently observed in this disease; for this will not be increased by moderate exposure. There is in these cases no inflammation to be aggravated, and no morbidly sensitive membrane to be irritated by the entrance to the air-passages of an atmosphere cooler than that of the house. There is probably not any increase of secretion to be checked," the sound as of mucus "being simply the result of accumulation of the ordinary secretion of the part, * * and upon this condition weather has little other effect, than as it has a tendency to enlarge or diminish the glandular tumours, upon the indirect influence of which that accumulation depends.

Dr Ley recommends the use of the hot or tepid bath, followed by frictions, unless the child struggle and cry violently, when, for obvious reasons, it will be prejudicial. He objects to the cold bath, on account of the fright and violent crying which it occasions, and because strong impressions of the cold on the skin are very ill borne by the class of children liable to the disease.

The regulation of the diet is of the greatest moment. Dr Ley judiciously recommends the mother, if healthy, and competent to the task, to nurse the child, objects to the system of half-nursing, and where the mother is unequal to the task of suckling, advises a healthy wet nurse to be at once provided. The following observations regarding the regulation of her diet deserve attention.

"Candidates for such situations would be little disposed to relinquish the care of their own offspring, but from an overwhelming necessity. Coming, however, to a house where they have a well-stored larder at their command, they are, from a mistaken kindness, often allowed to indulge to the full extent of their inclinations. Such sudden change of diet, at all times injudicious, is, under the present circumstances, peculiarly injurious to both parties; depriving the wet-nurse of her situation, and the child of healthful nourishment. A state of feverish excitement is induced, which injuriously affects the quality, and ultimately diminishes the quantity of milk. Besides, these children are generally weakly, and their digestive powers are enfeebled in a corresponding degree. They will not, therefore, bear the same extent, of aliment or milk of such nutritive properties, as other children will digest with ease. Great caution is consequently requisite so as to manage the diet of the nurse, that the milk, in quantity and quality, shall be proportionable to the exigencies of the child, and its ability to digest it. But it would ocupy too much space to enter minutely upon the subject of the regulation of the diet of wet nurses. The general principles are tolerably understood and attended to: but the *gradual* improvement requisite when they come from the miserable habitations and impoverished diet of indigence is a point which is too frequently overlooked."

Dr Ley conceives that the child should be suckled upon an average of at least ten months, and asserts that, according to his own observations and the opinions of other practitioners, the proportion of dry-nursed children who die varies from three-fourths and four-fifths. Cases will occur in which it is necessary to attempt to rear the children on artificial food, and for the management of such he gives much excellent advice regarding the quality and quantity of the nutriment, and the frequency and mode in which it should be administered.

Dr Ley, after recommending that when aperients are necessary for the removal of undigested materials, or the acid contents of the bowels, they should be of the mildest nature, and when there is not any manifest disorder of the secretions, emollient *enemata*, proceeds to consider the best means of removing the scrofulous taint. The various remedies and plans of treatment which have been proposed for this state of the constitution are passed in review, the proper applications to inflamed scalp pointed out, and the mode in which scarification relieves painful dentition explained. This interesting portion of the work, as well as what immediately follows regarding the treatment of the complication of the disease with head affection, diseases of the lungs and pericarditis, we are reluctantly compelled, from want of room, to omit. The view which he takes of the means, by which the causes of the paroxysms are to be obviated, deserves attention; but an abridgement would fail to do the subject justice. We must therefore be content to recommend these parts to the attention of our readers, and hasten to conclude the article by a brief notice of those remedies which Dr Ley recommends for the purpose of cutting short the paroxysm.

These consist in the application of warmth to the surface by means of the tepid bath, in which the child ought to remain during the whole attack, or at least for ten or fifteen minutes; cold applied suddenly to the face while the child is in the bath, or of stimulants, as ammonia, to the nostrils; irritation of the fauces to provoke vomiting, patting on the back and friction of the chest and abdomen; the object of all these, with the exception of the bath, being to procure a forcible expiration. Glysters also are useful from the expiration produced by the expulsion of the feces. Dr Ley also suggests in a query the propriety of introducing, if it can be accomplished without force, a tube through the contracted glottis, and in extreme cases tracheotomy. Of the propriety of the first, we have some doubts; but we would be much inclined, in hazardous cases, to try the second. When the disease has been of long duration, and congestion in the larger branches of the external jugular veins is evident, the detraction of a small quantity of blood might be useful.

We cannot conclude this notice without observing, that Dr Ley deserves great credit for the industry with which he has investigated this disease, and the original views which his labours have enabled him to produce on the subject. It is pleasant to meet with a work of this description, in which learning, talent and labour appear in every page. We trust that Dr Ley will by his future investigations support the reputation which the present work must inevitably confer on him.

Letter from Dr CARSWELL to Dr CRAIGIE, *with Reply.*

THE following letter from Dr Carswell, though dated on the 22d of April, came to hand only after the publication of the July number of the Edinburgh Medical and Surgical Journal.

"SIR, *London, 22d April* 1836.

"I was not a little surprised to find it stated by you in the analysis of Schroeder van der Kolk's Anatomico-Pathological Observations, &c. published in the last number of the Edin. Med. and Surg. Journal, that I had *adopted* the views entertained by that author respecting the seat, developement, &c. of pulmonary tubercles. By the term *adopt*, I presume you mean to imply that I had a previous knowledge of the labours of this pathologist; or, in other words, that my researches were undertaken, and my opinions formed on this subject, not ony subsequent to, but in consequence of my having read or heard of those of Schroeder van der Kolk. Such, I can assure you, is the impression which the statement in question has made on my mind, and must make on that of every person who reads it. I must therefore peremptorily state, that I was entirely ignorant of the existence of such a work as that of Schroeder van der Kolk, or of his opinions, until I perused the Edin. Med. and Surg. Journal a few days ago. This statement you are bound to believe, and, consequently, to give me that measure of justice which is due me in this matter in the next number of your Journal.

"Allow me to add that you would have acted much more in the spirit of a cautious, liberal, and just critique, had you stated that the opinions of Schroeder van der Kolk were similar to those to which I, as the result of my researches, had lately given publicity in my "Illustrations of the Elementary Forms of Disease," and that such a coincidence regarding the Pathology of Tubercular Formations, emanating from two individuals, who had investigated the subject separately, and unknown to each other, afforded the strongest confirmation of their accuracy.—I am, Sir, truly yours, R. CARSWELL.

"P. S. Circumstances prevented me from sending you this letter at the time it was written. I now send you it with the last published Fasciculus of my Illustrations."

To this letter, as the article, in which the expressions made the subject of complaint by Dr Carswell, was not anonymous, I beg leave to answer in my own name.

I have perused again the passage referred to by Dr Carswell, in the Account of the Pathological Researches of M. Schroeder van der Kolk; and I must be allowed to say, that I am unable to perceive any just ground of complaint. That the researches of that author were published in 1826, and the first number of Dr Carswell's Illustrations in 1833, is a circumstance for which I suppose I am not responsible.

I willingly acquit Dr Carswell of all knowledge of the researches and writings of M. Schroeder, agreeably to the terms of his own letter. The information therein conveyed, however, I read with equal astonishment and regret; nor was I to presume, that the researches of M. Schroeder, which were known over the whole of Europe, and which I had been in the habit of mentioning since 1832, in my Systematic Lectures on the Practice of Physic, and in the Clinical Course at the Royal Infirmary, were unknown to the Professor of Pathological Anatomy in the London University College.

The advice contained in the concluding part of the letter, I am happy to receive with gratitude, and I trust it shall not be lost upon me, and that I shall not again ascribe to Dr Carswell the merit of knowledge, when he is ignorant.

With regard to the conclusion which Dr Carswell has deduced from the coincidence which he has remarked between the doctrines of M. Schroeder and his own, on the origin and seat of pulmonary tubercles, I beg to assure him, that it gives me sincere pleasure to perceive, that an omission which had been made by my obtuseness, and which had probably been caused by knowing that the work of the former author was published in 1826, has been so ably and successfully supplied by Dr Carswell himself. D. CRAIGIE.

PART III.

MEDICAL INTELLIGENCE.

PATHOLOGY.

Analysis of two Concretions found in the knee of an old man. (From the Records of General Science, August 1836.)—Arthritic concretions were found by Dr Wollaston to consist of urate of soda, while some, according to Guyton and Fourcroy, were composed of phosphate of lime. M. Lassaigne had two sent to him, which were taken from the knee of a man, aged 70. One of them weighed 2½ grains. It was insoluble in cold and hot water, and in alcohol. Caustic potass had no action on it. The absence of uric acid was proved by no colour being produced when heated with nitric acid, and by the negative action of potassa. Muriatic acid dissolved a portion of it with effervescence, leaving a white opalescent animal matter, which, when submitted to the action of boiling water, was transformed into gelatine. Ammonia precipitated gelatinous flakes of phosphate of lime from the muriatic acid solution. The remaining liquid afforded a precipitate, with oxalate of ammonia indicating the presence of lime, which had existed in the concretion in the state of a carbonate. The concretion was analyzed quantitatively by calcining a portion, dissolving the residue in muriatic acid, and precipitating the phosphate of lime by ammonia. The constituents are,

Animal matter soluble in boiling water, -	37.2
Phosphate of lime, - - -	49.9
Carbonate of lime, - - -	12.9
	100.0

CHEMISTRY, MATERIA MEDICA, AND PHARMACY.

On the action of Iodine on organic salifiable bases. By M. PELLETIER. (From an abstract of a paper from L'Institut, given in the London and Edinburgh Philosophical Magazine, July 1836.) Iodine combines with most of the organic bases, in atomic proportions; thus strychnia forms a crystalline and coloured iodide composed of two equivalents of iodine and one of strychnia; brucia forms two iodides, one composed of two equivalents of iodine, and one of brucia, the other of four of iodine and one of the base; cinchonia and quina combine with iodine in the proportion of one to one. Iodic acid combines with the organic bases, forming neutral and acid salts, in which the acid and base exist in the same proportion as in their respective iodides. Hydriodic acid also unites with the organic bases, forming salts which have a tendency to an excess of base. Thus the hydriodates of brucia and strychnia are (sesquibasic) subsesquisalts without water of crystallization. The organic hydriodates are decomposed by iodic acid, iodine being set free and the hydriodate converted into an iodide. The action of iodine upon morphia forms an exception to the above. One part of iodine combines with the hydrogen of the morphia, forming hydriodic acid, while the other portion of the iodine unites with the substance resulting from the morphia. Morphia deprives iodic acid of its oxygen, which unites with one portion of the morphia, forming a red substance like that resulting from the action of nitric acid on morphia, the iodine evolved acting on the other portion of the morphia as it does by direct contact. The resulting combination, however, is decomposed by a fresh portion of iodic acid, and entirely converted into iodine and the red substance.

On the Non-existence of the Periodide, and the means of preventing the decomposition of the Protiodide of Iron. By Mr P. Squire. (From the London and Edinburgh Philosophical Magazine, July 1836.)—In a letter to the editors of the journal from which the following facts are taken, Mr Squire suggests that the change which takes place in the supposed formation of the periodide of iron by the exposure of the protiodide in solution to the free action of the air, consists in the peroxidation of a portion of the iron which subsides, its equivalent of iodine being left free in the solution of the unchanged protiodide. Even after a thin *stratum* has been exposed for several weeks, a portion remains unchanged, as is indicated by a protoxide of iron being precipitated by a solution of potassa. The periodide of iron, therefore, remains in the solution; nor could Mr Squire form it from a persalt of iron and iodide of potassium. He conceives, therefore, that no such compound exists. The tendency of the protiodide of iron to be decomposed, when kept in solution, is completely obviated by a coil of wire traversing the whole column of the solution. The experience of nearly three years has convinced Mr Squire that by this means the solution may be preserved perfectly neutral, though exposed to the action of air and light. More peroxide, indeed, will be formed, but the solution when filtered will be as colourless and transparent as distilled water. This is a sure test of its neutrality and purity. Any tinge, however slight, proves the presence of iodine in a free state. or some impurities, probably derived from the materials employed in its formation; and this may be the occasion of the difference of opinion regarding its action on the animal economy. The colourless neutral compound, when diluted, has an agreeable flavour, similar to that of a chalybeate spring, whereas any free iodine gives it a mawkish taste, and is apt to produce *nausea*.

Uncertainty of the effects of Prussic Acid. (From Mr Cormack's Treatise Creosote, 1836.)—Mr Cormack states that he was present at an experiment along with Dr J. Reid and Dr J. Y. Simson, when *an ounce* of Scheele's acid was administered to a dog. "Death did not ensue for about a minute, and other dogs of the same size were killed on that occasion as rapidly by six drops of the acid from the same bottle." The contractility of the heart was in none of the cases much, if at all, impaired.

Processes for preparing Aconitine. (From Dr Turnbull's work on the Medicinal Properties of the Ranunculaceæ, 1835.)—1. Let a quantity of the fresh root of the *Aconitum napellus* be cautiously dried, and reduced to powder, taking care not to inhale any of the fine dust. Digest one part of the powder by weight in two measures of strong alcohol, at a gentle heat for seven days, filter while hot, and reduce the fluid by slow evaporation to the consistence of an extract. The temperature by which this is effected must not be greater than barely sufficient to carry off the alcohol, otherwise the active principle will be destroyed or expelled. Liquid ammonia is then to be added to the extract drop by drop till, when stirred, it give out the odour of ammonia. If too much ammonia be added, the product will be decomposed. The mass now consists of impure aconitine, mixed with extractive and other matters soluble in water. The aconitine may be taken up with boiling alcohol or sulphuric ether, or the soluble matter may be removed by repeated washings with small quantities of cold water. If the latter plan be adopted, a quantity of light brown or gray powder will be left, which is to be purified by subsequent solution in alcohol. Aconitine is very powerful. Twenty drops of an alcoholic solution, in the proportion of one grain to a drachm of alcohol, being put into the mouth of a guinea pig, occasioned death in a few minutes.

2. Aconitine may be prepared in another way which yields it purer.

Dissolve the alcoholic extract prepared as above, without adding ammonia, in as much cold water as will take it up, decant the solution from the insoluble part and filter it. To the filtered solution, add liquid ammonia drop by drop, as long as it occasions a precipitate. When the precipitate has subsided, draw off the supernatant liquid by a syphon. Dry the precipitate without heat, and either purify it by repeated washings with cold water, or, what is better, dissolve it in as much alcohol as will take it up, and throw the solution into cold water. A precipitate will be formed of a white colour, which is aconitine in its purest form. The product must be carefully dried.

THERAPEUTICS.

Statistical View of the comparative frequency with which the Principal Medicines used during the last sixty years have been prescribed at Dublin. By Mr W. D. Moore, Licentiate of Apothecaries' Hall. (From the Dublin Journal of Medical Science, September 1836.)—Conceiving that it would be interesting and useful to ascertain with precision what medicines have been for some time most relied on for the removal of disease, Mr Moore made the following analysis of the prescriptions received at the establishment opened by his grandfather in 1780, of which accurate copies have been kept, and which afford materials for exhibiting the practice of the most eminent physicians and surgeons of Dublin for a period of nearly sixty years. To effect this, he has divided the entire time into three equal proportions, from each of which he has taken 1200 prescriptions, and marked the frequency with which each medicine occurred in them. The results are given in the following table:

	1780–98.	1798–1817.	1817–36.
Emetics,	74	7	6
Enemata,	58	7	20
Blisters,	47	64	39
Warm plasters.	45	10	3
Leeches,	1	20	45
	225	108	113
Antimonial Preparations.			
Tartar emetic,	104	31	50
James's powder,	4	36	44
Kermes mineral,	8	3	0
Antimonial powder,	14	28	15
	130	98	109
Narcotics and Sedatives.			
Opium,	102	79	116
Morphia,	0	0	4
Paregoric elixir,	72	28	13
Digitalis,	0	8	3
Hyoscyamus,	0	4	44
Lactucarium,	0	0	11
* Peruvian bark,	102	42	13
* Quinine, sulphate of,	0	0	20
	276	161	224
Saline Preparations.			
Alum,	5	1	1
Nitre,	45	9	11

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* We do not understand upon what principle these substances are classed under the head of Narcotics and Sedatives. We would have classed them as tonics.

	1708–98.	1798–1817.	1817–36.
Glauber's salts,	35	12	2
Sal polychrest,	38	0	0
Sulphate of potash,	0	12	22
Rochelle salt,	63	13	22
Epsom salt,	0	213	102
	186	260	160
Diaphoretics.			
Mindererus' spirit,	67	35	22
Citrate of soda,	3	12	2
——— potash,	6	0	1
——— ammonia,	0	2	21
Guaiacum,	32	10	2
Sarsaparilla,	8	15	5
	116	74	53
Stimulants, Antispasmodics, &c.			
Castor,	8	10	1
Musk,	4	1	0
Assafœtida,	18	7	12
Camphor,	9	22	52
Ammonia,	64	88	39
Ether,	9	22	2
Spirit of nitrous ether,	20	10	10
Iron,	22	42	20
	154	202	136
Preparations of Mercury.			
Calomel,	84	189	114
Blue pill,	17	39	156
Mercurial ointment,	35	11	1
Ethiops mineral,	15	0	0
Mercury with chalk, Mercurius alkalizatus,	18	6	35
	169	245	306
Purgatives and Aperients.			
Jalap,	136	35	14
Scammony,	80	120	51
Colocynth,	19	31	67
Aloes,	46	79	63
Senna	94	107	134
Castor oil,	62	73	32
Rhubarb,	81	59	170
Magnesia,	70	43	52
Syrup. Ros. Solut.	21	0	0
	609	547	583
Expectorants, &c.			
Hippo (ipecacuanha,)	62	58	152
Ammoniacum,	21	26	11
Squills,	33	47	45
	116	131	208
Iceland moss,	0	2	7
Basilicon ointment,	32	7	0

From the foregoing table, it would appear that the proportion of emetics in the first period is to the second as 10 to 1, and in the third as 12 to 1. Mr Moore refers this to its being then the practice invariably to administer an emetic on the accession of fever; and concludes from several circumstances, that the general use of this class of remedies was of recent date, and intimately connected with Dr Cullen's theory of fever. The diminished use of enemata during the last forty years, he conceives to be owing to the publication of Dr Hamilton's views on purgatives, from the circumstance, that the period when they were least employed commenced at the time when Dr Hamilton's work was published. Local bleeding has become more frequent since Broussais' doctrines have been promulgated, and the increase of its employment may partly account for the diminished use of blisters and warm plasters, the latter also having given way to stimulating liniments and other means of counter-irritation. "The great frequency of the occurrence of tartarized antimony in the first period is chiefly owing to its use as an emetic, and as it entered into the composition of almost every one given, at least sixty may be deducted, leaving its ordinary employment at forty-four, so that, except as an emetic, we meet with it most frequently in the third period." Though kermes mineral has ceased to be employed, the antimonial and James's powders have increased, and thus the total number of the antimonials is nearly equal in the three periods. The preparations of morphia appear to have displaced the camphorated tincture of opium rather than the opium itself; and Mr Moore remarks, that it seems to be the opinion of most physicians at present, that though they answer sufficiently well as a quieting addition to a cough mixture, they are not so advantageous as other preparations of opium, when the object is to procure a night's rest. The black drop he states to be most frequently used for that purpose. The preponderance of hyoscyamus now, is owing to its extract being frequently ordered in combination with blue pill as a corrigent. Previously to 1798, Peruvian bark was generally exhibited in powder, and the red bark was preferred. After that period, the infusion and tinctures of the pale bark began to be more used; and latterly, the sulphate of quinine has superseded all. Nitre and James's powder seem to have changed places in the favour of the profession. The citrates of potash, soda, and ammonia mentioned, are solutions obtained by neutralizing their carbonates with lemon juice, as they are generally prescribed in diaphoretic mixtures. Mr Moore attributes the increase in the use of the blue pill to Mr Abernethy's recommendation of it. Before his time, it was not exhibited, except as part of a regular mercurial course, never as an alterative at bed-time. The falling off of mercurial frictions is to be accounted for by the improved treatment of venereal affections. "Jalap has decreased, and rhubarb increased, more than any other remedies in the class of purgatives and aperients. The syrup or solution of roses, now completely gone out of use, was a frequent adjunct to aperient draughts and mixtures. Hippo (ipecacuanha) is much more used at present than formerly; and this will appear more clearly if it be considered, that in the first period, its use, as well as that of tartarized antimony, was chiefly as an emetic."

Mr Moore states, that fifty years ago blisters were seldom dressed with simple ointment, it being thought injudicious to allow a blistered surface to heal soon. They were generally dressed with basilicon, or with the ointment of an indigenous plant called Melilota (Trifolium melilotus officinalis of Linnæus.) To show the opinions formerly entertained regarding the treatment of blisters, Mr Moore gives the following quotation from the complete English Dispensatory for 1742, in which the Melilot is described as "consisting of warm subtile parts, mostly employed in dressing blisters, until they cease running and skin over, for its warmth still promotes the discharge, and prevents mortification, which in some constitutions they are very liable to, especially if dressed with things that are cooling, which the heat of the parts frequently provokes persons *very injudiciously* to venture upon."

SURGERY.

Gangrene of the Penis. (From the Gazette des Hopitaux, Jan. 1836.)—A youth, 16 years of age, with a fine white skin and red hair, was placed under the practice of M. Sanson in the Hôtel-Dieu. Five days previously he had had intercourse for the first time, with a girl of the town, and afterwards passed the night in onanism. In the morning the prepuce was inflamed, and covered the glans during erection, at the same time that there was false blennorrhœa with *balanitis*. Two days afterwards, he was received into the medical wards, whence after three days he was transferred to the surgical. The following appearances presented themselves: unequivocal traces of inflammation over the whole penis, which was red and swollen, from its base to the prepuce which covered the glans; a copious discharge of a thick muco-purulent matter from the orifice; on the dorsum, a spot an inch in diameter, of a gray slate colour and oval form. Through this a deep incision was made, which evacuated the fluids contained within the cells. Nevertheless the gangrene spread, and on the following day, the whole anterior part of the penis appeared sphacelated. By soothing and antiphlogistic treatment the inflammation abated, and the eschars separated; but the integuments and a great part of the glans, and the anterior extremity of the urethra were destroyed. In two months the wounds cicatrized, without any antisyphilitic treatment being adopted. The affection seemed to have been produced altogether mechanically.

MISCELLANEOUS.

GRADUATIONS AND SURGICAL EXAMINATIONS.

Medical Graduations at Edinburgh.—On the 1st of August 1836, the Senatus Academicus of the University of Edinburgh conferred the degree of Doctor of Medicine on the following gentlemen, in number one hundred and twenty-six, after having gone through the appointed examinations, and defended publicly their inaugural Dissertations.

Of Scotland.

Ewan Alexander, on Neuralgia.
Andrew Duncan Bain, on Apoplexy.
Robert Carlyle Bell, on Aneurism.
Sprott Boyd, on Mucous Membrane of the Stomach.
Alexander Brown, on Fevers and Inflammation.
Charles Brown, on Tetanus.
William Burnie, on Varicose Veins.
James John Cadell, on Tubercle.
Geo. Sydney Smith Clark, on Acute Peritonitis.
William Coke, on Adhesion of Wounds.
Abram Cox, on the Sympathy of the Brain and Spinal Marrow.
William Craigie, on Scarlet Fever.
Patrick Davidson, on Hepatitis.
William Dennison, on Apoplexy.
Francis Douglas, on Formation of the Secretions.
Henry Duncan, on Syphilis.
Charles Durie, on Aneurism and the Obliteration of Arteries for its cure.
John Freeland Fergus, on the Statistics of Consumption.
James Hopkins Forsyth, on the Moving powers of the Circulation.
Hector Gavin, on the Formation of Bone.
John Hendrie, on Inguinal Hernia.
James Hill, on Peritonitis.
George Carfrae Hope, on Hydrocele.
Henry Imlach, on Diseases of the Stomach.
Francis William Innes, on Mortality which prevails among Europeans on first arriving in India
Edward George Irving, on the Properties of the Leguminosæ.
James Johnston, on Delirium Tremens.
John S. Kilgour, on Peritonitis.
John Lorn, on Effects of Iodine on the Human Body.
David Macfarlane, on Asphyxia.
Donald Macfarlane, on Tetanus.
Don. Mackintosh M'Ewan, on Hydrocyanic Acid.
William M'Kinnan, on Asphyxia.

Gilbert Macnab, on the Botany of the Forfarshire Coast.

Alexander Logan Moffat, on Dropsy.

John Mure, on the Secretions and the Nervous System.

Ed. Nelson, on Planto-geography.

Silas Palmer, on Phthisis Pulmonalis.

Robert Paterson, on Mercurial Trembling,

William Primrose, on the Moving Powers in the Circulation, &c.

David H. Robertson, on Bronchocele.

James Robson, on Pseudo Inflammatory Appearances of the Mucous Membrane of the Stomach, &c.

John Scott, on Epilepsy.

Samuel Somerville, on Hydrocele.

Jonathan Forbes Thomson, on Curvature of the Spine.

Thomas B. Watson, on Necrosis.

William James Whyte, on Cynanche Laryngea.

David Elliot Wilkie, on Acute Pericarditis.

William Williamson, on Morbus Coxarius.

Thomas Williamson, on Empyema.

FROM ENGLAND.

Joseph Beaumont, on some Diseases of the Heart.

George Joseph Bompas, on State of the Mind in relation to Jurisprudence.

James Bedingfield Bryan, on Theories of Sounds, Motions, and Impulse of the Heart.

James Courtenay Bulteel, Is Healing by the first Intention always the result of Inflammation?

Reginald Burridge, on Treatment of Tubercular Kidney.

Richard Caton, on the Phenomena of Sympathy.

Edward Charlton, on the Lead Colic, compared with the Colic of Poitou, West Indies, &c.

George Duncombe Cox, on the Functions of the Spleen.

James Currie, on Hydrocephalus.

Robert Elliot, on Adaptation of Vision to Distance.

A. Fairbrother, on Metallic Colic.

Isaac Earl Featherston, on the Functions of the Brain.

Bernard Charles Furniss, on Scrofulous Diathesis.

James T. Hansard, on Asphyxia.

James Heygate, on Tic Douloureux.

John F. Hodgson, on Enteritis.

John Jones, on the Origin of Spring and Rivers.

Richard Kinnear, on Cow-pox.

John G. Pack, on Delirium Tremens.

Thomas Palethorpe, on Use of Stimuli in Fevers.

Theophilus P. Richmond, on Colour of the Blood.

Thomas Bell Salter, on the Medicinal Properties of Plants.

John Standen, on Excision of the Uterus.

John Milbourn Stokes, on the Uses of Secale Cornutum.

Nicolas Tyacke, on Thoracic Diseases.

William Watts, on Hysteria.

Wm. Hughes Willshire, on Chemical Changes produced on the Air and Blood by Respiration.

FROM WALES.

David Prothero, on Signs of Pregnancy.

C. R. Vachell, on Acute Pleurisy.

D. Walters, on the Pathology of ditto.

FROM IRELAND.

William Beamish, On Continued Fever.

William Browne, on Gout.

John Browne, on Dyspepsia.

John Francis Burke, on Uterine Hemorrhage.

John Campbell, on Treatment of Diabetes.

James Walker Chambers, on Injuries of the Head.

Henry Cloran, on Scarlatina.

Daniel Costelloe, on Pneumonia.

Richard Day, on Empyema.

Garret Dillon, on Peritonitis of Puerperal Women.

Valentine Duke, on Pneumonia.

John Smythe Glover, on Diseases of the Larynx and Trachea.

Charles Edward Homan, on Acute and Chronic Gout.

George Humphreys, on Inflammation of the Thoracic Viscera.

Thomas Kehoe, on the Intestinal Tube and Peritonitis.

Wm. MacCaskill, on Application of Cautery to Diseased Joints.

Richard Massy, on Difficult Dentition.

John Neilson, on Utility of Dispen-

saries conjoined with Hospitals.
John Moore Neligan, on Tubercular Phthisis.
James Owen, on Scarlet Fever.
Samuel Persse, on Hydrothorax.
John Scott, an Stricture of Urethra.
Wm. Starkey, on Puerperal Fever.
John Joseph Timmon, on Hooping Cough.
Walter Hale Walshe, on Acute Hydrocephalus, or Cerebral Fever, &c.
John Waters, on the Pathology of Peritonitis.
John H. Whittaker, on the Evidences of Pregnancy.

FROM ABROAD.

Haynes Gibbes Alleyne, from Barbadoes, on the Eye.
R. S. Black, from Nova Scotia, on Morbus Coxarius.
L. Q. Bowerbank, from Jamaica, on Feigned Diseases of Soldiers and Sailors.
C. J. G. De Boyesku, from Greece, on the Syphilitic Virus.
Edward J. Burton, from Canada, on Delirium Tremens.
Charles A. B. De Caux, from France, Coup d'Œil sur les Luxations Simples.
Charles Cogswell, from Nova Scotia, on the Predisposing Causes of Urinary Concretions.
Thomas Duncan, from Grenada, on Tetanus.
Robert Dunlop, from Berbice, on Asphyxia from Submersion.
John Edw. Hewett, from Barbadoes, on Tetanus.
John M'Lagan, from Demerara, on Absorption.
William Macinder, from Canada, on Dyspepsia.
James Paul, from Jamaica, on Variola.
John B. Thomson, from Bengal, on Misplaced Gout.
George C. Wallich, from India, on Pneumonia.
John Wilkinson, from South America, on Inflammation.

Surgeons' Hall Edinburgh, 1st September 1836.—Since 31st August 1835, the following Gentlemen have offered themselves as Candidates for the Diploma of the Royal College of Surgeons of Edinburgh, and after producing satisfactory evidence that they had completed the course of study prescribed by the College, have been admitted to examination, and found fully qualified to practise the arts of Anatomy, Surgery and Pharmacy, and have received Diplomas as Licentiates of the College accordingly.

Scotland.
David Booth,
Andrew M'Lellan,
Alexander Stein,
James Cowpar,
Robert Johnston,
William Lumsden,
Andrew Laurie,
James Dunsmure,
David Skae,
Alexander Hunter,
William M'Kechnie,
William Montgomery,
Robert Waugh,
Lawrence Jameson,
Charles Black,
John Law.
William Steele,
John Lorn,
Evan Alexander,
Robert Christie,
Charles Brown,
Arthur S. Thomson,
Henry Johnston,
George Forster Hay,
David Graham Niven,
Donald Robertson,
Thomas Glen Johnston,
William Robertson,
Donald Macfarlane,
Alexander Dickson,
David Johnston,
Ambrose Blacklock,
Richard M'Hattie,
William Williamson,
John Broomfield Weir,
Robert Carlyle Bell,
Sprott Boyd,
Gilbert MacNab,
Robert Walker,
John R. Johnston,
Andrew C. B. Neill,
Thomas Somerville,
John Hendrie,
Hugh Thomson.
George Hood,
Daniel Ritchie,
Andrew Davidson,
William T. Anderson.
William M'Kinlay,
Alexander Blair,
William Walker,
Bryce Johnston M'Whir,
Robert A. M'Dougall,
Fredrick M. Thomson,
William Burnie,
George Lumgair,
George Lucas,
Duncan C. MacDonald,
James Oliver,
William M'Kinnan,
William Primrose,
James Stewart,
John Mure,
Thomas Moffat,
James Johnston,

James Ramage,
John Coats,
George Stewart Beatson,
Thomas Williamson,
Patrick Cannan,
Thomas Cannan,
Alexander Ramsay,
William Dickson,
Alexander Brown,
Henry Imlach.
James John Cadell,
George Cossar,
John Gillespie Wood,
James Johnston,
William Large Laurie,
Thomas Murray,
George Rae,
Thomas B. Watson,
Jonathan F. Thomson,
Fogo Harkness,
William Bell,
Alexander Duncan,
Bethune Horsbrugh,
John Wallace,
William C. Common,
Joseph Hobb,
Thomas Crawford,
William Thomson Weir,
William H. Brown Ross,
James Macaulay,
William Orr,
William Macaulay,
William Henderson,
John Johnston,
Robert Leslie,
Robert Braid,
Robert H. S. Clanahan,
John Sinclair Innes,

England.

Solomon Smith,
George Fearnley,
James W. R. Dickson,
James Henry Martin,
Evan Pierce,
James George Cooper,
William H. Brownson,
Thomas Palethorpe,
James Bedingfield Bryan,
[illegible] Pringle,
George Parker May,
Thomas [illegible] Seller,
Nicholas [illegible],
Theophilus P. Richmond,
John Fletcher Hodgson,
Richard Charles Guise,

Ireland.

David Scannell,
Joseph S. Prendergast,
John Fitzsimons,
John D. MacDiarmid,
Robert Rodgers,
Arthur Hartnett,
James Owen,
Charles Scott,
John Roche O'Bryen,
James Reed,
William L. Methven,
Charles Ferres,
Edward John Burton,
Robert Wilson,
John Richards,
John Campbell,
Charles Douglas,
James W. Crawford,
Daniel Costelloe,
John Browne,
Thomas Kehoe,
William Beamish,

Abroad.

Catharine C. H. Grant,
David A. Carnegie,
John Bathurst Thomson,
John James Henderson,
Thomas James Stirling,
Lewis Quier Bowerbank,
James A. Dunbar,
George F. Thomson,
Alexander W. Campbell,
James Alexander Fraser,
James Wight,
William Henry Tucker,
Joseph E. Cummins,
Thomas Duncan.

Extracted from the Records of the Royal College by
WM. SCOTT, *Sec.*

Charter proposed to be granted to the London University.—WILLIAM IV., by the grace of God of the United Kingdom of Great Britain and Ireland, King, defender of the faith: to all to whom these presents shall come, greeting. Whereas we have deemed it to be the duty of our Royal office, for the advancement of religion and morality and the promotion of useful knowledge, to hold forth to all classes and denominations of our faithful subjects, without any distinction whatsoever, an encouragement for pursuing a regular and liberal course of education; and considering that many persons do prosecute or complete their studies, both in the metropolis and in other parts of our United Kingdom, to whom it is expedient that there should be offered such facilities, and on whom it is just that there should be conferred such distinctions and rewards, as may incline them to persevere in these their laudable pursuits. Now, know ye, that for the purpose of ascertaining, by means of examinations, the persons who have acquired proficiency in literature, science, and art, by the pursuit of such course of education, and of rewarding them by academical degrees, as evidence of their respective attainments, and marks of honour proportioned thereunto, we do, by virtue of our prerogative royal, and of our especial grace, certain knowledge, and mere motion, by these presents for us, our heirs and successors, will, grant, declare, and constitute during our royal will and pleasure, and all the persons whom we may hereafter appoint to be Chancellor, Vice-Chancellor, or Fellows, as hereinafter mentioned, one body politic and corporate, by the name of the University of London, by which name such body politic shall have perpetual succession, and shall have a common seal, and shall by the same name sue and be sued, implead and be impleaded, and answer and be answered unto in every court of us, our heirs and successors. And we do hereby will and ordain that, by the same name, they and their successors shall be able and capable in law to take purchase, and hold to them and their successors any goods, chattels, or personal property whatsoever, and shall also be able and capable in law notwithstanding the statutes of mortmain, to take, purchase, and hold to them and their successors, not only all such lands, buildings, hereditaments, and possessions, as may be from time to time exclusively used and occupied for the immediate purposes of the said University, but also any other lands, buildings, hereditaments and possessions whatsoever, situate within our United Kingdom of Great Britain and Ireland, not exceeding the annual value of L. 10,000 ; such annual value to be calculated and ascertained at the period of taking, purchasing, or acquiring the same ; and that they and their successors shall be able and capable in law to grant, demise, alien, or otherwise dispose of all or any of the property, real or personal, belonging to the said university, and also to do all other matters incidental or appertaining to a body corporate. And we do hereby further will and ordain, that the said body politic and corporate shall consist of one Chancellor, one Vice-Chancellor, and such number of fellows or members of the senate as we shall from time to time appoint under our sign manual ; and that our trusty and well beloved the aforesaid be the first chancellor the first vice-chancellor, and the said be the first fellows and members of the senate thereof.

That whenever a vacancy shall occur in the office of chancellor of the said university, either by death, resignation, or otherwise, we will, under our sign manual, nominate a fit and proper person to be the chancellor instead of the chancellor occasioning such vacancy.

That the office of Vice-Chancellor of the said University shall be an annual office, and the Vice-Chancellor herein before named shall, at the expiration of one year from . go out of office, and the said fellows or members of the senate shall, at a meeting to be holden by them for that purpose, on some day within a month before the expiration of the said office, of which due notice shall be given, elect one other fit and proper person to be the Vice-Chancellor of the said University, and so from time to time annually ; or, in case of the death, resignation, or other avoidance of any such Vice-Chancellor before the expiration of his year of office, shall, at a meeting to be holden by them for that purpose as soon as conveniently may be, of which due notice shall be given, elect some other fit and proper person to be Vice-Chancellor for the remainder of the year, in which such death, resignation, or other avoidance shall happen ; such person to be chosen from among themselves by the major part of the Fellows present at such meeting, and to be approved of by the Chancellor of the said University for the time being.

That we reserve to ourselves to be the visitor of the said University of London, with authority to do all those things which pertain to visitors, as often as to us shall seem meet.

That the Chancellor, Vice-Chancellor, and Fellows for the time being, shall have the entire management of and superintendence over the affairs, concerns, and property of the said University ; and in all cases unprovided for by this our charter, it shall be lawful for the Chancellor, Vice-Chancellor, and Fellows, to act in such manner as shall appear to them best calculated to promote the purposes intended by the said University, and the said Chancellor, Vice-Chancellor, and Fellows shall have full power from time to time to make and also to alter any by-laws and regulations (so as the same be not repugnant to the laws of our realm, or to the general objects and provisions of this our charter) touching the examinations for degrees, and the granting of the same, and touching the mode and time of convening the meetings of the Chancellor, Vice-Chancellor, and Fellows, and in general touching all other matters whatsoever regarding the said University; and all such by-laws and regulations when reduced into writing, and after the common seal of the said University has been affixed thereto, shall be binding upon all persons members thereof, and all candidates for degrees to be conferred by the same, all such by-laws and regulations having been first submitted to one of our principal Secretaries of State, and approved of and countersigned by him.

That all questions which shall come before the Chancellor, Vice-Chancellor, and Fellows, shall be decided by the majority of the members present, and the chairman at any such meeting shall have a vote, and in case of an equality of votes, a second or casting vote.

That no question shall be decided at any meeting, unless the Chancellor, or Vice-Chancellor and five Fellows, or, in the absence of the Chancellor and Vice-Chancellor, unless six Fellows at the least shall be present at the time of such decision.

That at every meeting of the said Chancellor, Vice-Chancellor, and Fellows, the Chancellor, or in his absence the Vice-Chancellor, shall preside as chairman, or, in the absence of both, a chairman shall be chosen by the members present, or the major part.

That the said Chancellor, Vice-Chancellor, and Fellows for the time being, shall have full power from time to time to appoint, and, as they shall see occasion, to remove all necessary examiners, officers, and servants of the said university.

That once at least in every year the said Chancellor, Vice-Chancellor, and Fellows, shall cause to be held an examination of candidates for degrees, and on every such examination the candidates shall be examined either by examiners appointed for the purpose from among the fellows by the said Chancellor, Vice-Chancellor, and Fellows, or by other examiners so to be appointed; and that on every such examination the candidates shall be examined in as many branches of general knowledge as the said Chancellor, Vice-Chancellor, and Fellows, shall consider the most fitting subjects of such examination.

And whereas it is expedient to extend the benefits of the colleges and establishments already instituted, or which may be hereafter instituted, for the promotion of literature and science, whether incorporated or not incorporated, by connecting them for such purposes with the university created by this our royal charter. We do hereby further will and ordain that all persons shall be admitted as candidates for the respective degrees of Bachelor of Arts, Master of Arts, Bachelor of Laws, or Doctor of Laws, to be conferred by the said University of London, on presenting to the said Chancellor, Vice-Chancellor, and Fellows, a certificate from any of the institutions hereinafter mentioned, to the effect that such candidate has completed the course of instruction which the said Chancellor, Vice-Chancellor, and Fellows, by regulation in that behalf shall determine.

That such certificates as aforesaid may be granted from our college called London University College, or from our college called King's College, or from such other institution, corporate, or unincorporated, as now is or hereafter shall be established for the purposes of education, whether in the metropolis or elsewhere within our United Kingdom, and as we, under our sign manual, shall hereafter authorize to issue such certificates.

And for the purpose of granting the degrees of Bachelor of Medicine, and Doctor of Medicine, and for the improvement of medical education in all its branches, as well in medicine as in surgery, midwifery and pharmacy, we do further hereby will and ordain that the said Chancellor, Vice-Chancellor, and Fellows, shall from time to time report to one of our principal Secretaries of State what appear to them to be the medical institutions and schools, whether corporate or incorporated, in this our metropolis, or in other parts of our United Kingdom, from which, in the judgment of the said Chancellor, Vice-Chancellor, and Fellows, it may be fit and expedient to admit candidates for medical degrees, and on approval of such report by our said Secretary of State, shall admit all persons as candidates for the respective degrees of Bachelor of Medicine and Doctor of Medicine to be conferred by the said University, on presenting to the said Chancellor, Vice-Chancellor, and Fellows, a certificate from any such institution or school, to the effect that such candidate has completed the course of instruction which the said Chancellor, Vice-Chancellor, and Fellows, by regulation in that behalf shall determine; and it shall be lawful for the said Chancellor, Vice-Chancellor, and Fellows, from time to time, with the approval of one of our principal Secretaries of State, to vary, alter, and amend any such reports, by striking out any of the said institutions or schools included therein, or by adding others thereunto.

That the said Chancellor, Vice-Chancellor, and Fellows, shall have power to confer the several degrees of Bachelor of Arts, Master of Arts, Bachelor of Laws, Doctor of Laws, Bachelor of Medicine, Doctor of Medicine, and that such reasonable fees shall be charged for the degrees so conferred as the said Chancellor, Vice-Chancellor, and Fellows, with the approbation of the Commissioners of our Treasury shall from time to time direct; and such fees shall be carried to one general fee-fund for the payment of the expenses of the said University, under the directions and regulations of the commissioners of our Treasury, to whom the accounts of income and expenditure of the said University shall once in every year be submitted, which accounts shall be subject to such examination and audit as the said Commissioners may direct.

That at the conclusion of every examination of the candidates, the examiners shall declare the name of every candidate whom they shall have deemed to be entitled to any of the said degrees, and the departments of knowledge in which his proficiency shall have been evinced, and also his proficiency in relation to that of other candidates, and he shall receive from the said Chancellor a certificate, under the seal of the said University of London, and signed by the said Chancellor, in which the particulars so declared shall be stated.

Provided always, that all by-laws and regulations made from time to time touching the examinations of candidates and granting of degrees, shall be submitted for the consideration of one of our principal Secretaries of State, to be approved of by him.

And lastly, we do hereby for us, our heirs, and successors, grant and declare that these our letters patent, or the enrolment or exemplification thereof, shall be in and by all things valid and effectual in law, according to the true intent and meaning of the same, and shall be construed and adjudged in the most favourable and beneficial sense for the best advantage of the said University, as well as in all our courts as elsewhere, notwithstanding any non-recital, mis-recital, uncertainty, or imperfection, in these our letters patent. In witness, &c.

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